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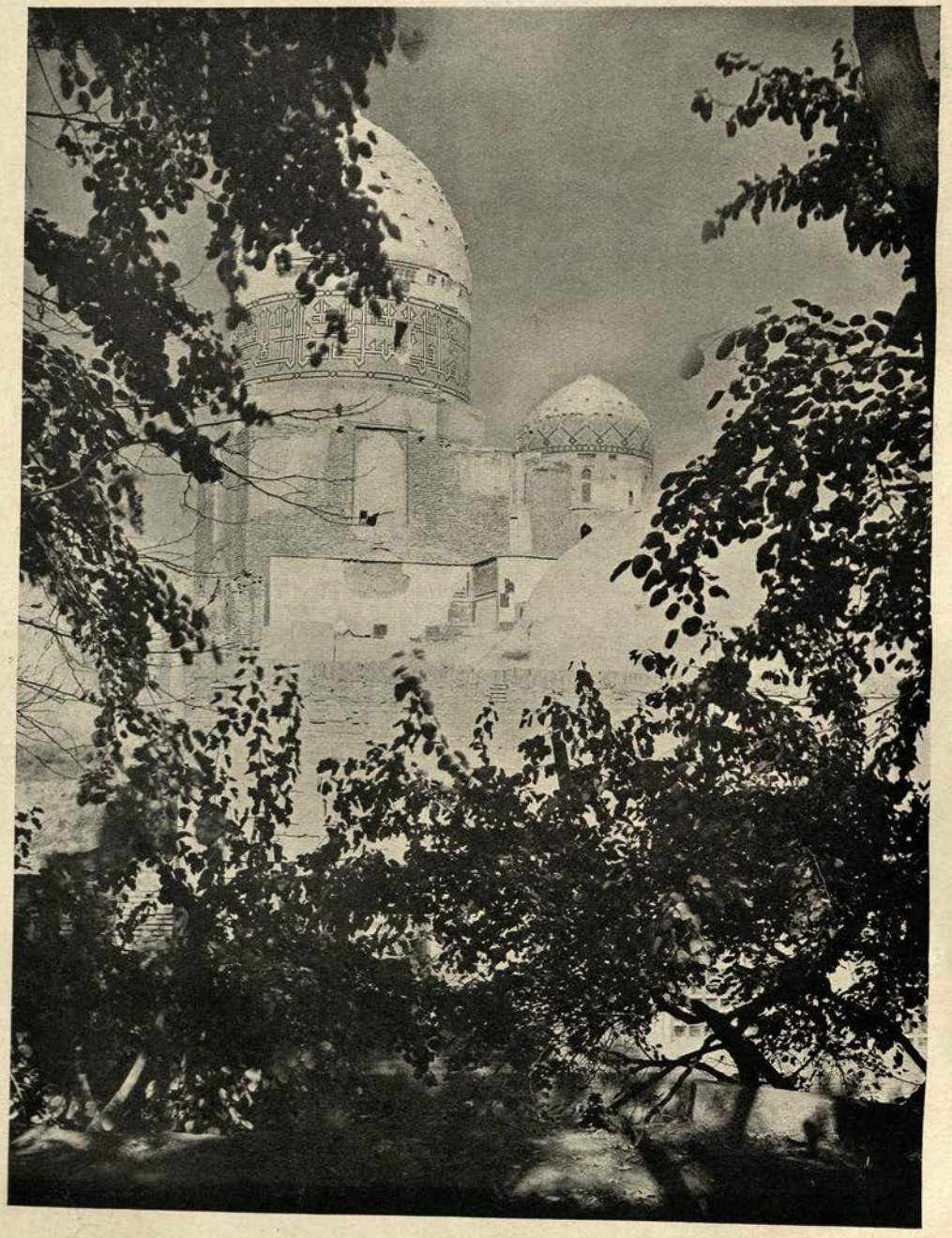

Shakhzinde at Samarkand.

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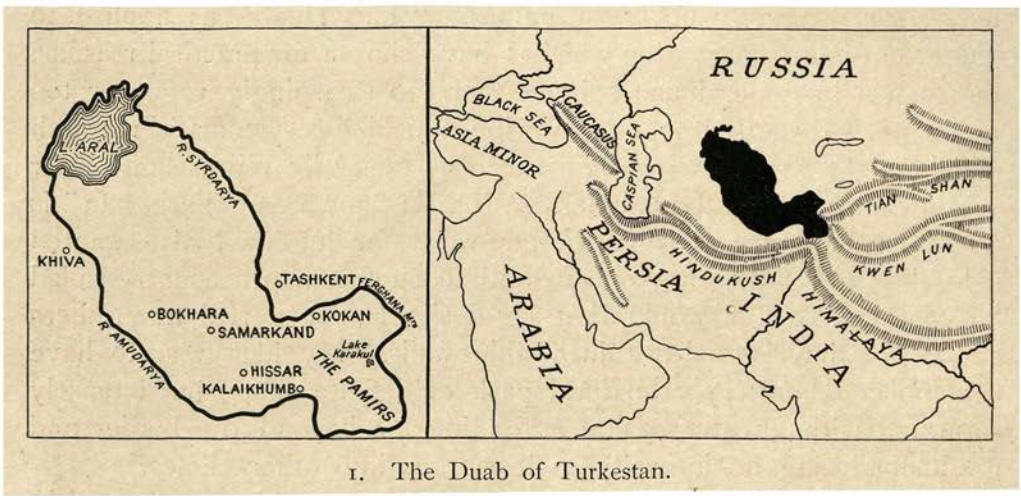
Here we have the Pamirs and all the most important ranges radiating from them to the west, with their glaciers, fauna and flora. Between these rivers—they themselves being the all-embracing distinction, the beginning and end of the whole—we find a complete collection of typical phenomena from the summits of the mountains to the cities of the plains and to the salt in the Sea of Aral. Turn to what you like, to climatology, geology, zoology, botany, to the human races, to political economy and history, to the Russian conquest, administration and present commercial development, search every department of science as applied to Turkestan, and you will find all the central and leading facts or types included in the Duab.



1. The Duab of Turkestan.

The Duab in this sense is, of course, not an indigenous name but an artificial, scientific term like the Alps, the only difference being that it has been made instead of having grown historically out of topographic misunderstandings and literary generalisations. Apart from purely political dominions nearly all the geographical names of Inner Asia denoting large districts were created by European travellers and writers. Peoples who have no maps use only two kinds of names: definite, special names for every topographic feature, however small, which they own or visit regularly; and vague names for foreign lands, such as anything across the mountains, to the east, across the sea or river, belonging to other tribes, or any appellation chance or fancy may beget. Only European science and politics with their statistics

and classifications have produced an abundance of terms of definite international value. The origin of the name of a large district is still very often traceable to a small place or to local usage. Turkestan was only a town before it became one of the greatest expressions in modern history and geography.

A sharp boundary is always something arbitrary, just as classified nature compared to living nature. But the more artificial a system the

2. Turrets and Bastions of Conglomerate (Yakhsu).

clearer and simpler it becomes, as witness political frontiers. So-called genetic systems are often a contradiction in terms. There is continuous shifting from special to general or vague, from abstract or artificial to concrete or applied. The "Germans" were perhaps a small tribe before "German" attained a wide, racial sense, and now "Germany" is a strictly defined political area, although it often lends its name to more vaguely distributed features of central Europe. A book on the "Birds of Germany" might just as well be called French or Swiss or Austrian birds, for the bulk remains the same. The national name simply stands

for each people's own glass case containing a but slightly varied collection from the common ground.

The Duab of Turkestan is a strictly topographic boundary enclosing a typical assortment of natural things. What is within *is* Duabic; anything without—but within Asia—*may* be duabic (compare "Alpine" and "alpine"). The geometrical definition is limited but the application extends to many physical characteristics widely distributed over Asia. The Duab is a place with the atmosphere of Turkestan.

3. Gossips.

The Pamirs, that massive nucleus which covers a surface equal to that of Ireland, is not only an orographical centre of Asia but also possesses political interest in the highest degree. Thus the Duab mountains form one of the most important links in the grand Eurasian chain stretching from the Pyrenees to China. Its lowlands are part of the enormous northern (Russo-Siberian) plain of Eurasia, which is the largest in the world. Likewise the Aralocaspian depression is included in the largest area of inland drainage on the globe.

The total surface is about 250,000 square miles (595,000 sq. km.) peopled by 5,000,000 inhabitants, who are however very unequally distributed.

Many historians ascribe to Turkestan and especially to the Duab regions a preponderant influence on the origin of the Aryan peoples. The province of Samarkand and the khanate of Bokhara almost correspond to Sogdiana, to which Bactriana joined on in the south. Alexander the Great took Samarkand in 329 B.C. Huns and Turks conquered these regions during the sixth century A.D., the Arabs in the eighth, and Genghis Khan established his empire during the thirteenth century.

After the death of Tamerlane (1405) his dominions split up into many small states, the playground of incessant wars, until Russia gradually incorporated the Duab in the course of the nineteenth century.

Politically the whole belongs to Russia, the independence of Bokhara being nominal only. The Duab borders on China and Afghanistan, while the frontiers of the British and Persian Empires are not far off.

Ethnographically we find here all the races and tribes, settlers as well as nomads, of Middle Asia, or their equivalents. Close neighbours and occasional visitors are the "national" Afghans and Persians. By a national people I mean, of course, that typical, modern combination to which the name applies in every sense, being Afghan, Persian and so forth not only by descent but also in features, language, religion, dress, habits and, very often, politically. From a genetic point of view, i.e. racially and historically, there are practically no boundaries in continental Asia.

4. An Araba.

Mongol and Aryan elements have about an equal share in the population. In enumerating the various races I shall follow the German savant Schwarz who has written the best general work on Russian Turkestan. To begin with, however, I shall have to say a few words anent the name "Sart," which is to be found in nearly every book. In common parlance and every day life the Russians use "Sart" in much the same way as British colonists would speak of "niggers." It is applied to all and sundry "natives" whose dress does not single them out at once (Jews, Turkmen, Kirghiz) or who are not evidently foreigners (Europeans, Afghans, Chinese, Hindu, etc.). "Sart" is the "ordinary native" of Bokhara, Samarkand and Ferghana. For this reason no importance whatever can be attached to this description unless the speaker or writer clearly specifies his meaning. The origin of the term is local. It has been used for centuries by the Duab peoples to designate the peasants of the plains and the dwellers in the towns, that is to say, all those who are not nomads, mountain

tribes, foreigners or Jews. This is the second and true application. Thirdly: Sart is also an ethnological distinction to which scholars have given a specific value. Schwarz says that the word Sart has an ethnological meaning applied to a people which are neither pure Uzbek, nor Kirghiz, nor Tajik. Their language is Turki and their type is as different from that of the Mongoloid Uzbeks and Kirghiz as from that of the Indo-germanic Tajik, being perfectly independent and peculiar. They are a mixture resulting from the intermingling of the Indo-germanic aborigines with all the races which have lived and ruled in Turkestan during the last two thousand years. Thus "Sart" has three possible meanings. I shall only use it in the second sense of typical, settled native, having chosen "Uzbeko-Sart" to express the scientific definition.

5. Ladies of the Harem.

Numerically and economically the Uzbeko-Sarts are the preponderating element, forming, as they do, the majority of cultivators and traders. But they are also the worst portion, especially in the towns. On the whole they are cowardly and cruel, liars and cheats, and given to every kind of vice. Outwardly they pose as dignified gentlemen and perfervid Muhammadans. The Tajiks are far better, while the nomads (Kirghiz and Turkomans) and mountain peoples (Galchas) most nearly conform to our ethical ideas. We must not forget, however, that among children of nature, especially among nomads, mere thieving cannot be called a fault of character. The same applies to curiosity and fits of temper, while so-called lying can generally be traced either to indifference or to the eastern love of exaggeration. Likewise, we should take a lenient view of boorishness and suspicion towards strangers at a first meeting and of the reluctance to give information,

all primarily due to the instinct of self-preservation, alas! but too well justified. It is only when hypocrisy and cowardice are added to the faults of the child, the warrior and the peasant, that the tribe becomes an undesirable one, despised both by general and inter-racial consensus of opinion.

The Tajiks are also a mixture but more Aryan in every way, having preserved themselves more or less from the last Mongol (Uzbek) invasion. They speak a Persian dialect.

Pure, original, nomadic Uzbeks are very few in number, but divided into many sibs of high lineage, some of which have furnished rulers for the thrones of Bokhara and Kokan. Being the only pure remains of the Mongol conquerors they form a kind of racial aristocracy. Some writers have used the name Uzbek in the sense of Uzbeko-Sart.

6. Children of Bokhara.

The great nomads of Asia are the Kirghiz, and they are well represented in the Duab. Their origin points back to some near relationship with the Uzbeks, for their family names and language show close similarity. Of their mode of life I shall speak in the course of my narrative.

In Transcaspia the noble race of the Turkomans (Turkmen) replaces the Kirghiz as the great nomadic nation. Sections of some of their easternmost tribes live on the right bank of the Amu-darya. Their name is sufficient indication of their origin. They are the Beduins of Middle Asia and among the proudest, if poorest of the nomad tribes. Of horses they only keep a few, but these are the best in Turkestan, the Turkoman treating his steed like a child, even valuing it above his goods and wives.

Among the mountains, in the valleys of the Zarafshan and Yagnob, in Darwaz and Wakhan, we find the Galchas or Indo-germanic Pamir peoples in whom the students of Aryan origins take such an ardent interest.

Of Arabs a few sporadic occurrences have been traced. They are probably the remnants of Arabs settled by Timur.

Jews of a pure and ancient type are found in every town. According to their own tradition these native Jews are descendants of those brought here by Assyrian and Babylonian kings. They are everywhere called "Bokhara Jews," probably because their strongest colony and intellectual centre is at Bokhara, where also their original mode of life is most typically preserved. Their daily language is Persian.

Of Mongolian varieties represented in the country one may also mention the Karakalpaks, Kuramas, Kipchaks, Kalmucks, Targauts and the Tatars from Kazan and Siberia. Two kinds of Gipsies are also found.

7. Among the Zarafshan Mountains; Rest on the Glacier near Akhun Peak.

Amongst visitors we meet Persians, Afghans, mostly traders or political refugees, and the Indians from the Panjab. These latter, called Multani by the natives, mostly hail from Shikarpur and are detested all over Turkestan as the worst of usurers. From what I saw of their houses they are also the dirtiest of all the various races. Russia has banned them from districts under her administration and will probably soon give them notice to quit Bokhara.

Last, not least, we have the Russians, the conquerors, rulers and colonists of to-day.

A noteworthy fact in connection with the Duabic population is the minority of the female element, there being only from 80 to 90 women for every 100 men.

Leaving aside the Christianity of the Europeans and a few mysterious Pamir sects, the whole of the Duab is under the sway of

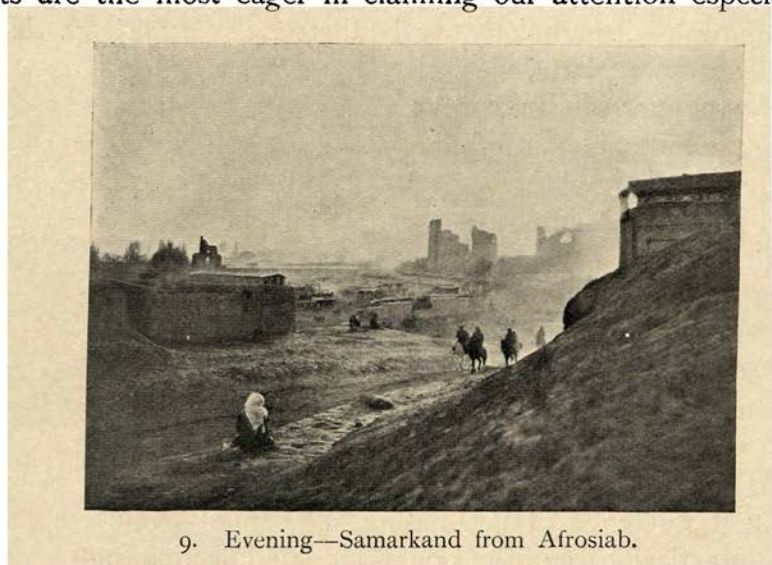
Islam. The nomads only profess their religion nominally, but the settlers, and especially the Bokharan subjects, may be counted among the most fanatical Moslems in the world. In Bokhara, however, religious fervour is the work of a few leading spirits as is best shown by the condition of things across the Russian border where spiritual tyranny is hardly noticeable. Here one never hears of quarrels between Christians and Mussulmen, the population being exceedingly tolerant on both sides. The Russian administration has strictly forbidden all proselytising even on the part of the Orthodox Church. This wisdom has excellent results, contrasting favourably with the questionable effect of missionary work in other countries.

The geography of pathology can be dismissed very briefly. Natives suffer chiefly from malaria, inflammation of the eyes, small-pox and an occasional epidemic of cholera. Characteristic diseases, though not numerically important, are leprosy, a thread worm called rishta (*Filaria medinensis*) and the "Sart complaint," namely a kind of Aleppo boil. Even in the cities which are so filthy according to our notions, the dry climate seems to prevent the frequent occurrence of decimating epidemics. The steppes and deserts are practically free from contagious or infectious diseases, their inhabitants mostly dying of various complications, accidents, starvation, neglect or old age.

8. In a Market Place at Bokhara.

Europeans can easily preserve their health by the simplest elementary precautions. The disease to which they are most liable is malaria, more than half the foreign population suffering regularly from it. It is, however, relatively harmless death being hardly ever immediately traceable to it. At times, of course, it must prove a predisposing cause, owing to its weakening effect upon the human body. Next in order come, intestinal catarrhs, mostly due to gross carelessness in eating or drinking, internal inflammations, rheumatism and veneric diseases. Briefly, the Duab climate may be described as a healthy one for European constitutions.

The fauna is palæarctic with a few immigrants from the south, such as the tiger and the cobra. Wild sheep are among the most characteristic and typical denizens of the mountains all over Asia, and they are ubiquitous in the Duab. Wherever the ground rises above dead level forming hills however small, wild sheep are sure to occur. Red marmots and birds of prey, especially the bearded vulture (lämmergeier), are most familiar to the traveller in the mountains, while in the plains one hardly ever sees anything more exciting than a troop of gazelle. Sturgeon, carp and waller are plentiful in the great rivers, while *Scaphirhynchus* is a curious fish for which the Amu-darya is remarkable. Insects are the most eager in claiming our attention especially in the

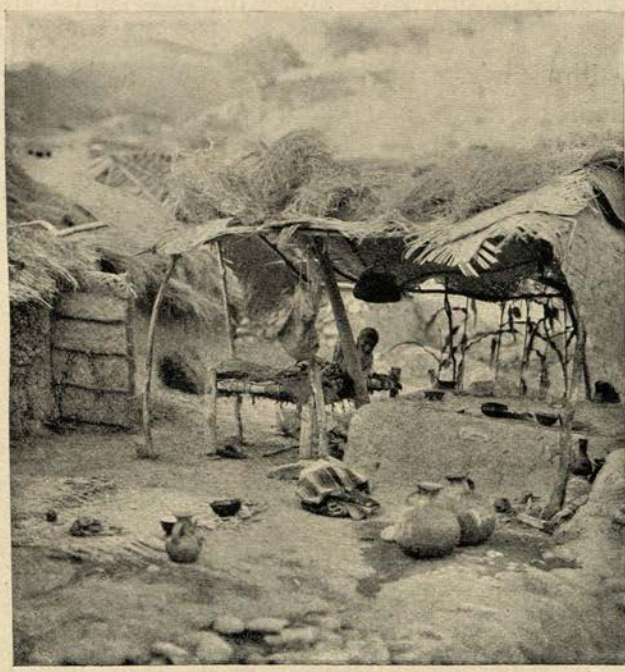


9. Evening—Samarkand from Afrosiab.

shape of flies and mosquitos and the usual vermin with its irrepressible claim upon our companionship. Scorpions, tarantulas and others of that ilk abound in the earthy districts but nobody really fears them. The only dangerous spider is a little black animal called Karakurt by the Kirghiz. Its sting is said to be deadly to cattle and great losses are ascribed to it in a few localities.

The flora is that of the deserts, steppes, cultivated lands and alpine mountains of the hotter temperate zone. The absence of the spruce (fir) is worth mentioning. Carruthers found the first spruce just outside the Duab in the extreme western end of the Tianshan, so that here we observe a sharp boundary between two important botanical districts.

As to communications we shall have plenty of opportunity for studying the native caravan roads and mountain paths during our travels. The Russians developed a good system of post roads immediately after the occupation of the country, many of which are now superseded by railway lines traversing nearly all the more important centres of cultivation. The last great undertaking will be the projected railway *via* Aulie-ata, Vierny and Semipalatinsk, which is to connect the Siberian and Turkestan systems. Steamers run on the Oxus and on the Sea of Aral.



10. Picturesque Disorder.

It goes without saying that the advent of steam and electricity have revolutionised trade. Before the Russian occupation the imports from India *via* Afghanistan or Persia were very important, the risk incurred from nomadic robbers on the northern routes having much to do with this. Now things have changed and Russia supplies almost everything. Indian trade declines swiftly, save for green tea without which the natives cannot exist and which is not obtainable elsewhere. A few muslin goods and a small quantity of opium hardly weigh in the balance.

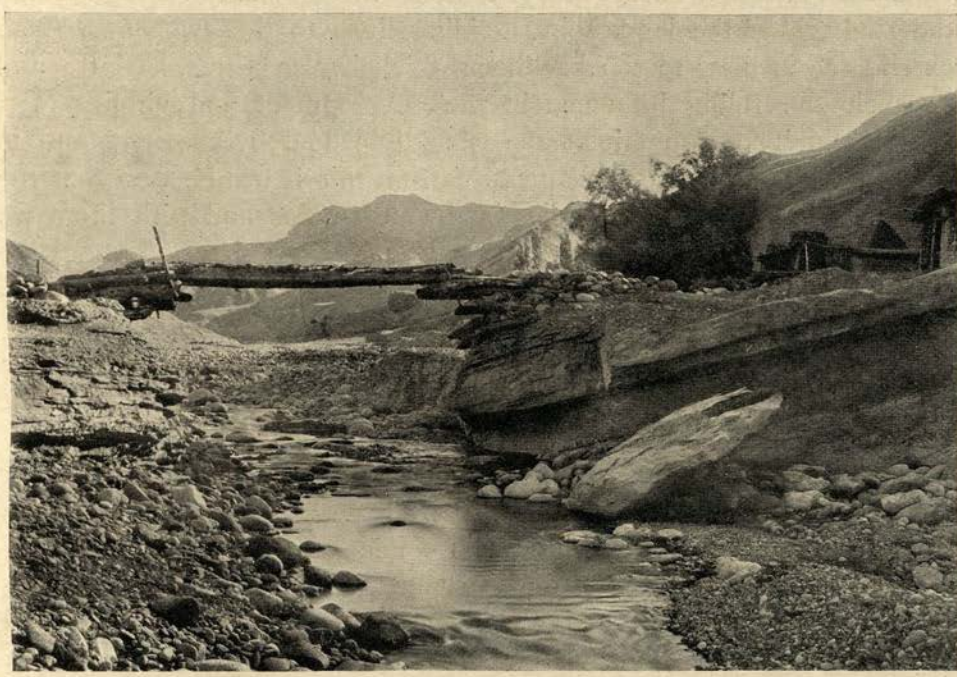
in the remotest corners, while with the exception of the civilised centres murderous attacks are practically unheard of.

Such is the Duab, a section of Asia, from the Pamirs to Lake Aral. Here we have glaciers, foothills, deserts, steppes and landlocked seas. We have fertile countries; we have all the peoples and remnants of peoples that made one of the greatest histories of the world; we have Bokhara and Samarkand. We have the conquest, the new era promising to the land a magnificent future of industry and commerce, for the Duab is the Egypt of Russia.

Around all this, fed by a thousand veins, are the two great rivers, the beginning and the end, the life and content of the whole, from which they are born and in which they die, which they lovingly encircle as a harmonious entity, self-contained and grand.

11. A Public Meeting.

Although the shape of the ground is the initial cause, the question of imprisoned rivers is not quite so simple as appears at first sight. If there were more rainfall many of the interior basins would easily fill up and overflow, there being no very considerable difference of level between their bottom and the lowest point of the rim. Thus the problem is one of action and reaction between surface and climate. Australia is almost entirely a desert in spite of being surrounded by a

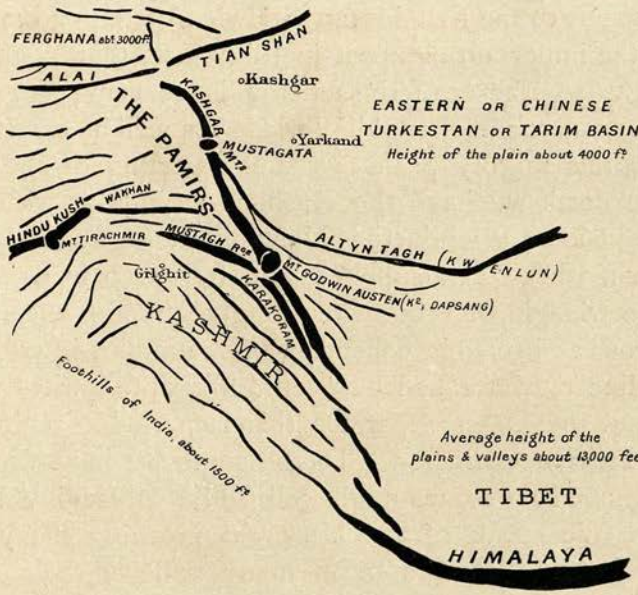


12. A Bridge in the Mountains.

vast ocean. Its neighbour, New Zealand, on the contrary, boasts of a moist climate, but then it has high mountains with snow and ice. This shows us that latitude being equal, mountains are the great decisive factor of climate. Upon their height, extent and position the distribution of water and life largely depends. The vapours of the torrid zone are condensed on the southern slopes of the Himalaya, thus forming a stagnation of rain clouds to which India owes its fertility. As witnessed by frequent famines this rainfall becomes irregular towards the South of India, agriculture being endowed with a speculative

the spokes. To the eye which arranges and connects the lines of the map the Pamirs form the focus of radiation. But viewed in the light of geological history this centre is one of effect not of cause. The solid bulk of the pillar of Asia owes its origin to the meeting and intersection of the long mountain folds.

Where the crests of these waves crossed each other in their tumultuous upheaval a kind of compact eddy, a labyrinthic surf was formed. But the reader should not look upon this picture as anything more than a simple metaphor, symbolising one of the most complicated



13. The Orographical Centre of Asia.

convulsions of the earth's crust. Maybe another century of patient exploration and surveys will pass before we are able to unravel these mysterious interlacings in a definite and scientific manner. In parenthesis I may mention that the high Eurasian mountains, the Alps, the Caucasus and the Himalaya are, geologically speaking, very young, inasmuch as the folding up responsible for their present elevation happened during the tertiary age which is the latest of the three great epochs of geological history and the last during which considerable uplifts took place.

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ultimate northern rim of the Pamirs—the Alai valley being one of the outer Pamirs—then the mountain ranges of the Duab present themselves as a fraying and drawing out of the upper plateau towards the west. The rivers show it clearly enough. All the right affluents of the Oxus, including the Zarafshan, are a pouring out from the inside of the crescent, whereas the flank of the Alai chains can only develop a few short streams intended for left-hand tributaries of the Sir-darya.

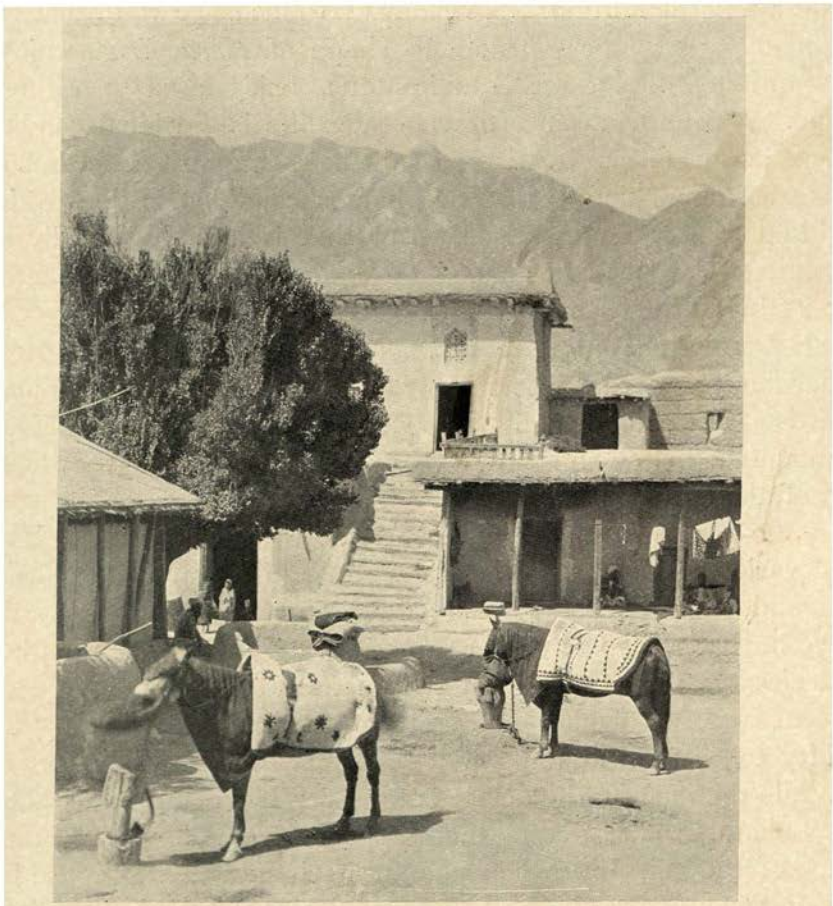
The Duab side of the Amu-darya is, of course, only one-half of its basin or drainage area, but it is the more important half as regards the

16. The Upper Ten and the Populace; Types of Karategin.

quantity of water. The surface of the complement, namely, northern Afghanistan and Transcaspia, is much larger but of its rivers five do not reach the main channel, a fate which is only shared by two on the left bank, one of them being the Zarafshan, which by itself does almost more useful work for humanity before it dies than all the Afghan affluents of the Oxus taken together. The reason for this is the general tendency of draining towards the south-west which we observe in the western fan-tails alike of the Tianshan, the Alai and Hindukush.

sense is the patchiness of the vegetation or, in plain language, its moth-eaten and mangy aspect. The grasses and herbs grow singly or in tufts, leaving dusty earth between them (Figs. 120, 123, 124, 156, 159, 171, 188, 189).

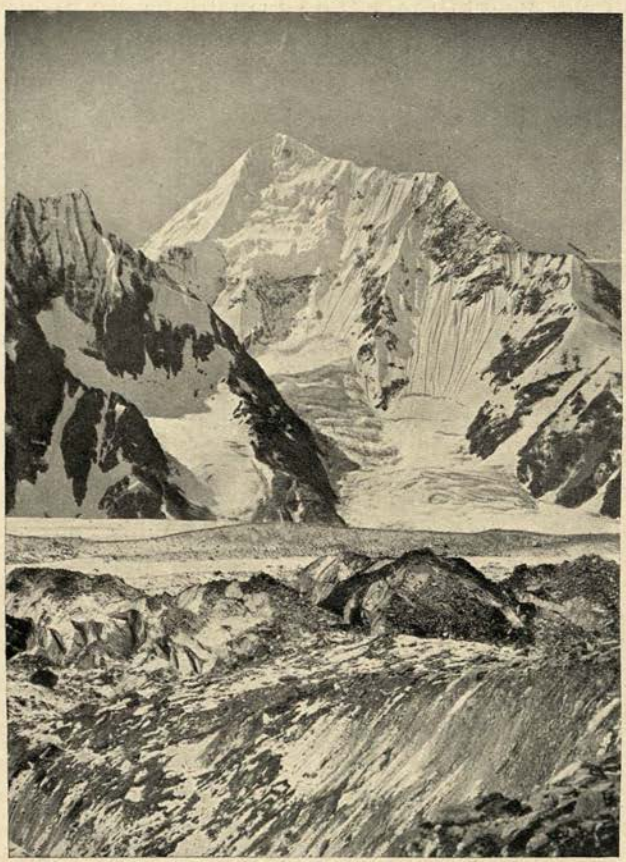
In its typical sense the name of the steppe ought to be restricted to grass land with a vernal flora and affording some sort of pasturage.



17. A Rich Man's House and Courtyard (Karategin).

But geographers have acquired a habit of using it biologically, identifying it with any kind of straggling, poor or dry vegetation, even scattered trees being admitted into some subdivisions of the term. Thus, while the various kinds of desert are classified according to their minerals and surface formation, the addition of a new element, namely,

vegetation, determines the higher order of the steppe. Hearing of a sand-steppe, we know that it must be a sandy place or perhaps a sea-shore with a thin sprinkling of weeds or shrubs; an astragalus steppe must be a colony of isolated tragacanth (milk vetch) bushes. Third in order come what may be called the forms of full life represented by the



18. Mount Akhun on the Zarafshan Glacier.

familiar trinity of forest, field and meadow (marsh). These hide the soil so completely that we describe them by their plants or groupings or their usefulness to man. The negative influence of a dry climate rules the desert; the relation of plants to the soil gives the cue to the definition of the various steppes. There is thus a genetic meaning included in these names, a suggestion of cause. Deserts reflect the killing power of the sun; steppes express the degree of hospitality

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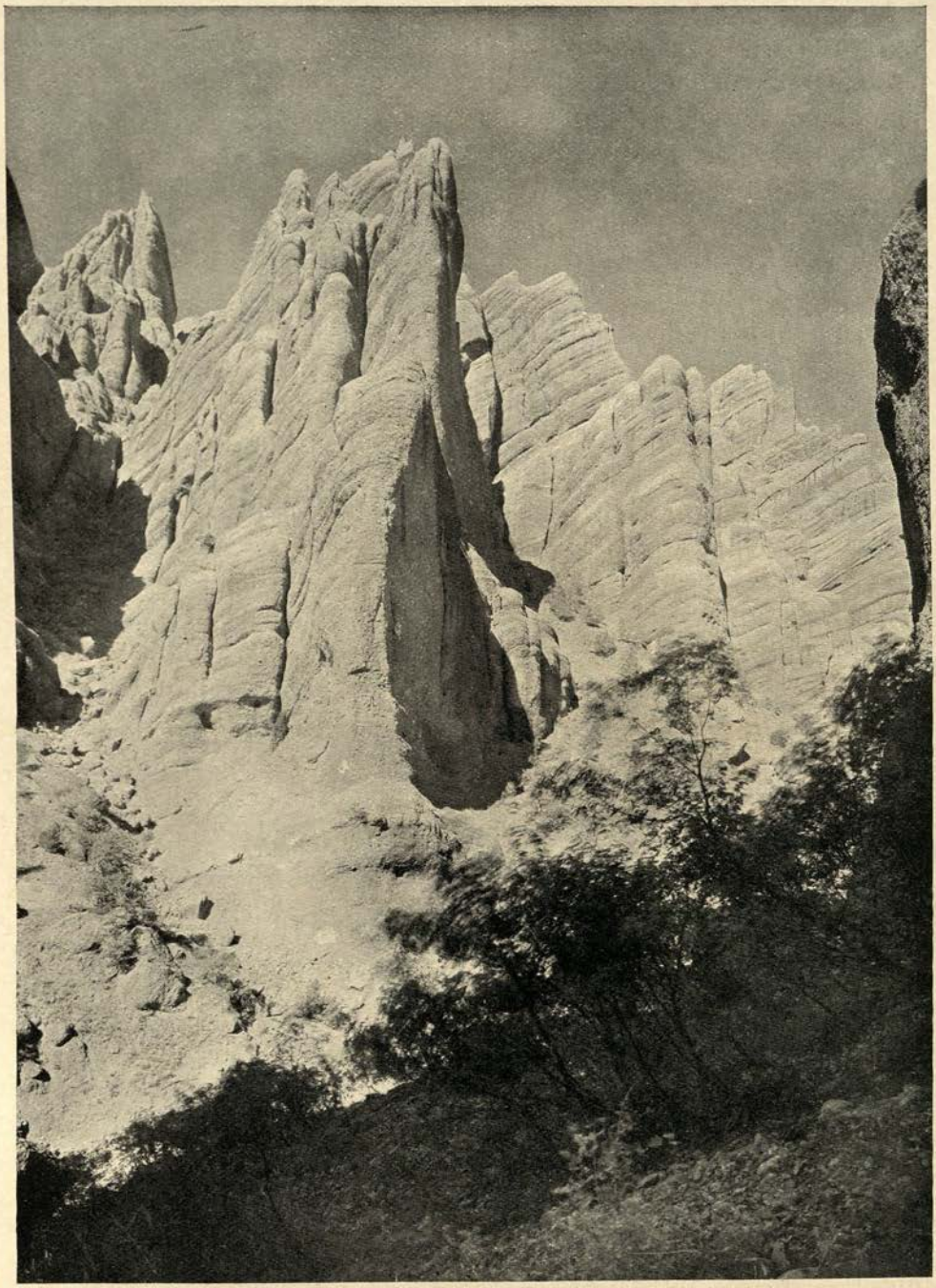
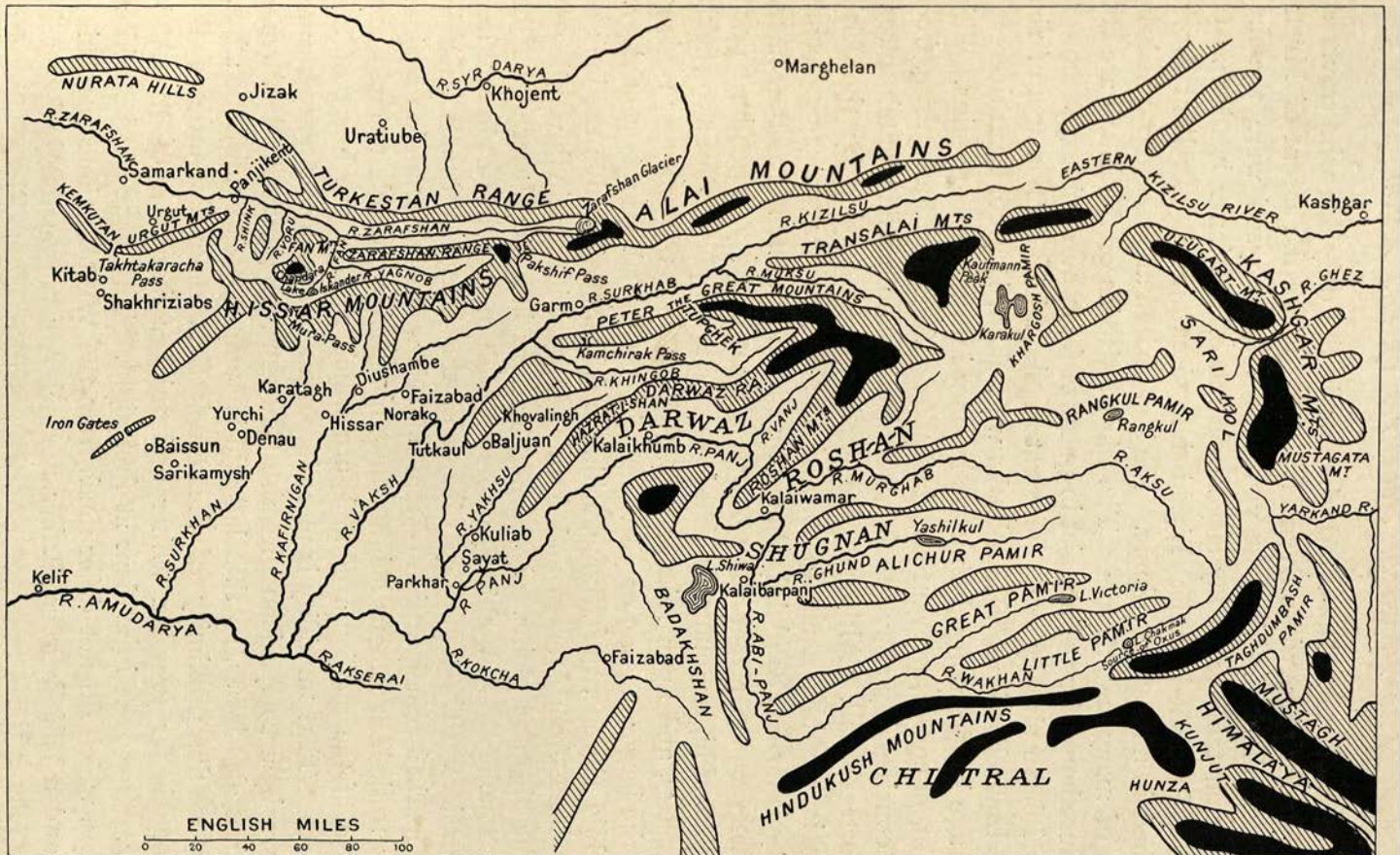
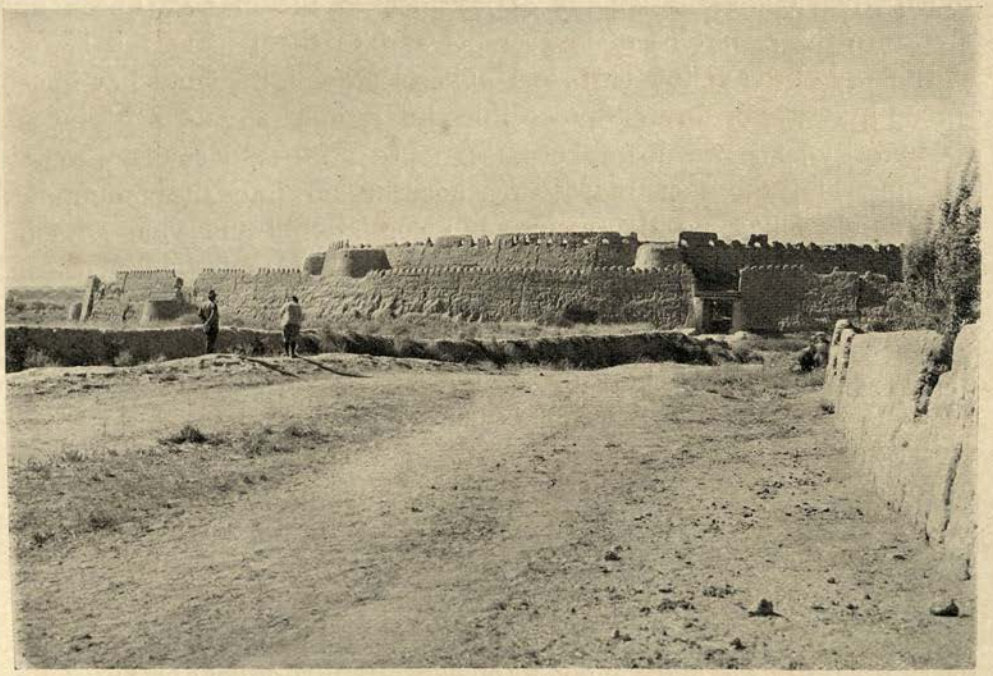


19. Among the Yakhsu Conglomerates.



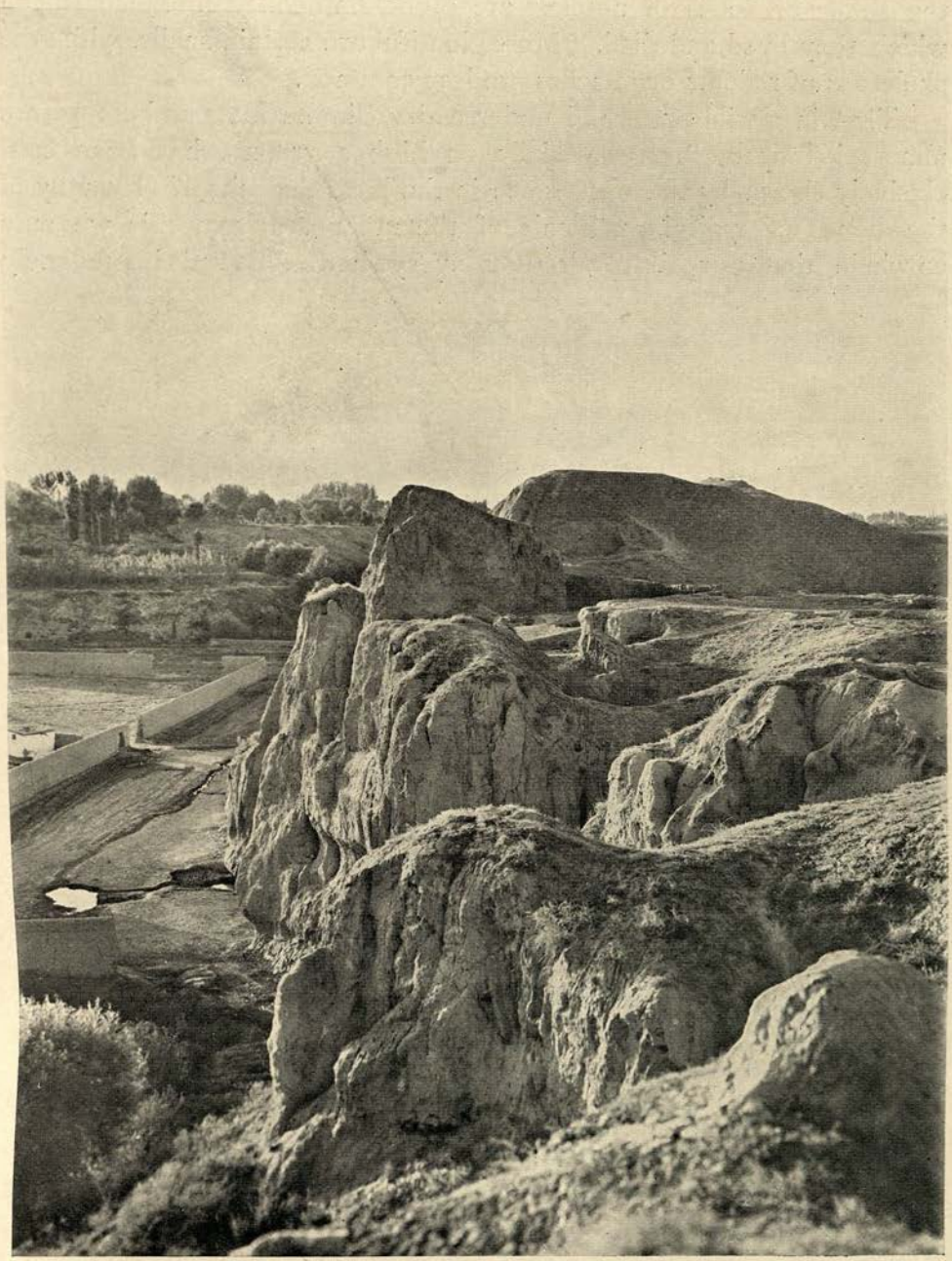
20. The Pamir Mountain System. A sketch of the more important ranges; the highest elevations are shown in black.

Oberland 46·30°). The Eastern Alps are slightly drier than the central and western portions, but in the Caucasus this phenomenon of continental influence is illustrated in a striking manner. The snow line is much higher in the Eastern Caucasus than in the western half and the aspect of the landscape correspondingly drier. After having made due allowance for the solar climate or latitude we thus find that owing to the dryness of the atmospheric climate the Duab wears a lesser coat of eternal snow than its majestic elevation entitles it to.



21. A Castle of Mud (Denau).

The number of glaciers in the Alps is 1155 and that of the Duab, unknown at present, will not prove much inferior, judging from what I have seen and read so far. Number alone is no indication of power, but sufficient proof of the fact that the mass as a whole is well above the level of glacier formation. The total surface and volume of snow and ice cannot be calculated before the country has been mapped like Switzerland in an exact manner and on a large scale. The Zarafshan glacier is so far the longest of the Duab, measuring 14 miles or 23 km. (Aletsch 17 miles).



22. A Loess Cliff at Samarkand.

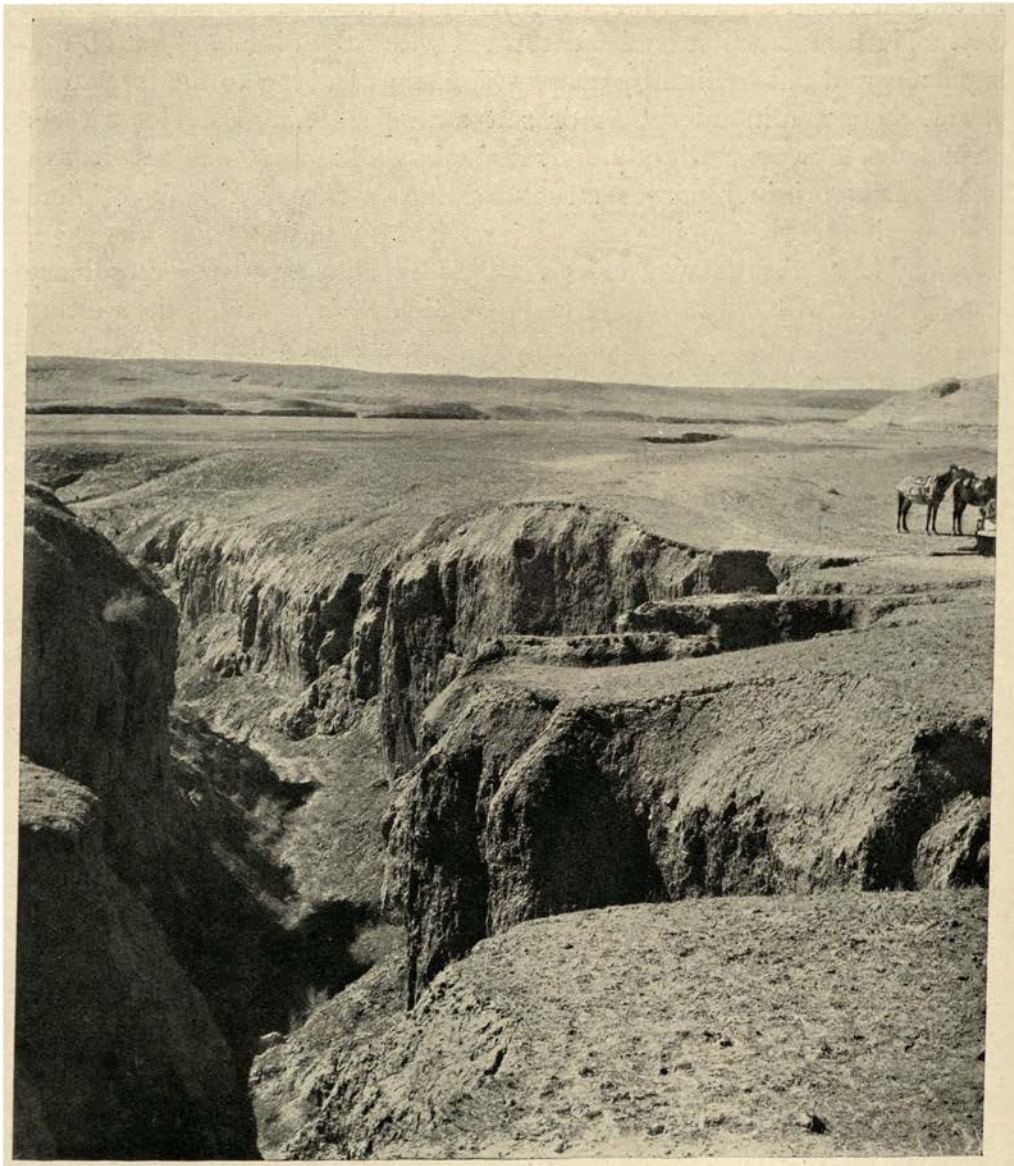
the shells or bones of animals are found embedded in the earth on which they lived and died. Most plentiful are certain snails, while the skeletons of rodents or gazelles are less common.

That in a wild state and under a dry climate loess and steppe are almost identical terms, especially on higher ground, has been conclusively shown by the occurrence in the loess deposits of Germany of the bones of typical mammals of the steppe. From this we may conclude that a spell of drought everywhere followed immediately

23. A River Valley in the Loess.

upon the glacial period. But this dry interval did not last long in Europe, being relieved by more modern conditions, as one is led to infer from the lesser thickness of this formation represented by the belt of straggling loess hills from Hungary to France. It steadily increases towards the east until we reach China, the loess country *par excellence* where the face of earth is smothered under a yellow load sometimes many thousands of feet in thickness, cut up by vertical canyons and precipices and swarming with a population that live in it as well as on it.

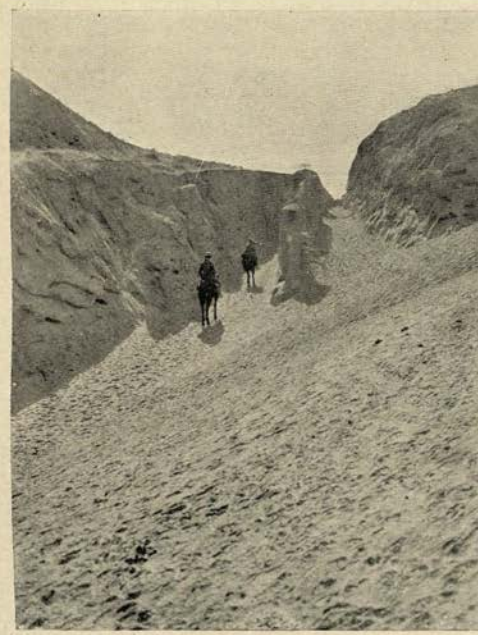
up nor so low down. The grandest and widest circulation on our planet is that of the air. All others are subject to it according to the



24. Loess Canyon in the Steppe near Guzar.

weight and mutability of matter. Every succeeding and smaller return depends on those which involve and support it. Dissolved into its

minutest particles, water floats in the air which tore it from the bosom of the sea. Wind shifts it as clouds and in the shape of mist it hides the view. Clay "evaporates" on the great plains. Rasped off the surface by violent gusts, it rises to the heights in the embrace of ascending whirls and storms. The drifting dust sometimes attacks us like a shower of rain, or on a hot, still day, enshrouds us like a thick and yellow fog, which slowly settles down upon the ground. Nevé is porous water; loess is spongy clay, is the solid earth-sea of the lowlands raised to a height and deposited in a lower level than the water changed to snow. But the two unite when the mountain snows melt, flowing together in a hurrying line of muddy water, a frothy, seething turmoil. Then they slow down, settling calmly and separating from each other, seeking their own level of plain and sea. Three elements they are, three states and three circulations—air, water, earth—all driven by the fourth, by the fire of the sun.



25. A Double Cutting in the Loess; formed by the Tread of Caravans.

This much I wanted to say as a general introduction to the physical aspect of the Duab and its place among the surrounding features of Asia. For this region I can truthfully claim the same distinction as that possessed by New Zealand, namely, as a collection of geographical models. "The unending variety, the striking freshness, and diagrammatic clearness of almost every conceivable geographical feature have been dwelt upon by many writers..." (*Geographical Journal*, November, 1910). Curiously enough the paper on the Waitaki basin from which these words are culled also contains three photographs that might have been taken on the Zarafshan glacier and on the Pamirs. Can there perhaps be some relationship between these

distant lands, so widely apart in their disposition—the one continental, the other oceanic? Or shall we assume that it is merely a question of different causes leading to similar effects? Be that as it may, one thing is certain, that the Duab is equally a natural and plastic diagram of the fundamental laws of physiography. Some day a comparison between these antipodes may shed new light on great theories. Here and there our vision is directed towards the mountains as if an answer was expected from them, and to the Duab mountains I am pledged.

26. Autumn's Bounty.

The mountaineer whom one leads to the city gates of Bokhara the Holy will not express enthusiasm about the landscape. True, the fruit gardens are lovely, steppe and desert have their melancholy beauty, but can the pedestrian for ever dream in the shade or patiently perambulate into endless distance? The waters are sluggish and however far we may stride with dogged obstinacy our view point remains ever the same, the middle of infinity.

Whoever has tasted of the glacier spring, on him is the spell. His is a peculiar state of the mind: nature in the plains can never satisfy him for long. Are they not all beautiful—the heath, the peat

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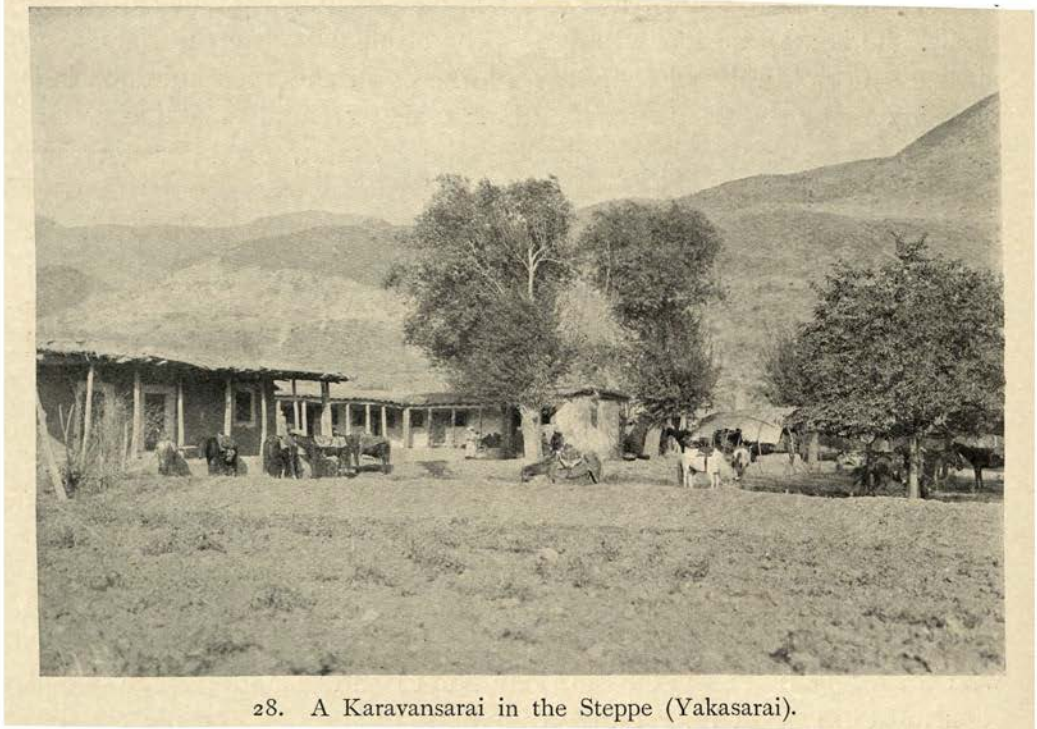
open, and those menacing the railway are chiefly in the great Karakum of Transcaspia, between Merv and Charjui.

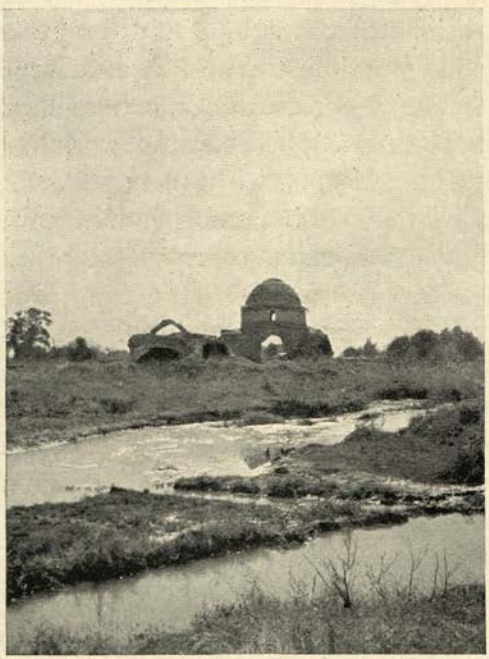
The plants of the steppe and sand have only a short season, namely, spring, for summer to them is as useless as winter. They are protected against drought and evaporation. Excessive transpiration is checked by a reduction of foliage, the leaves being turned into almost invisible scales which lie close to the stem, or a large portion of the leaves are changed into thorns which at the same time afford protection against



28. A Karavansarai in the Steppe (Yakasarai).

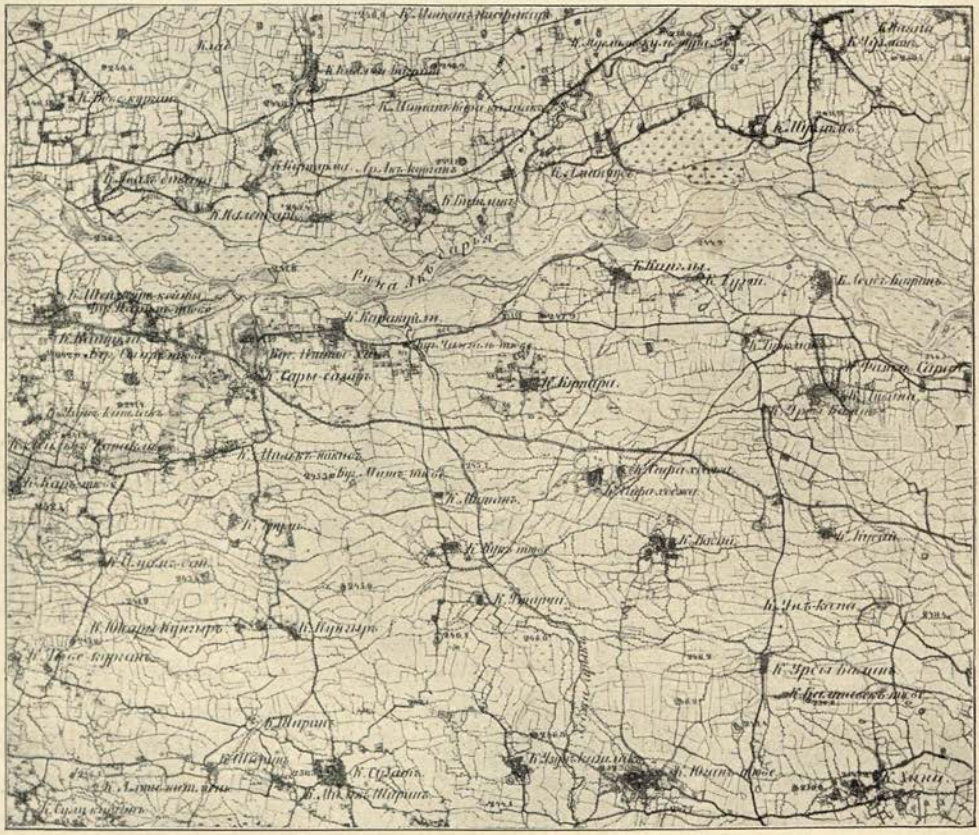
animals. Others again have hairy or woolly coats as a shield from sun and air. Many of them withdraw their vegetative parts and a store of nourishment into bulbs or thick roots which lie dormant during the dry season and winter. Therefore bulbous flowers, having a ready fund of building material, sprout with amazing rapidity, gaily carpeting the ground in a few days, thus being able to make the best of a short season. In other countries, such as America, this kind of vegetation makes a speciality of succulent stems or leaves protected by tough skin and acting like water reservoirs. To these belong the cacti and

in the still water have so little slope that the stream is obliged to spread out fan-like into many branches or distributaries. Obeying the same fundamental law, a stream must split up when its force is weakened by a diminution of its water and by an opposing army of sand hills blocking the way in every direction. Nor could very much be done with this last blood of the Zarafshan come to the end of a life pulse of healthy circulation. I imagine that by now, after having passed Samarkand and Bokhara, the water must be pretty well "salted up." This salinity is not noticeable to our taste, but one cannot allow it to become stronger. It is a weak solution which can still keep the salts moving in suspense, and which must be passed on before getting so concentrated as to form a deposit on the slightest provocation. Irrigation requires plenty of water owing to great losses by evaporation, and because part of it must be kept flowing, must be passed *through* the fields, for if it were always left to the dregs it would but clog the soil with an accumulation of noxious minerals. When new steppe of the lowlands is reclaimed the action of the first water brought on to it consists in washing out the bad salts. Subsequently their accumulation must be prevented. Therefore irrigation is always coupled with an irreducible minimum of drainage. Stagnation is death to all things, or, expressing the case more correctly, every kind of life, organic or inorganic, every physical condition on earth depends on some sort of circulation for the maintenance of its individuality, character, existence. When the circulation upon which it depends sinks below a certain minimum another form of life or surface steps in. Thus our food plants are superseded by salt plants or sand



29. A Forsaken Monument.

seems to be less densely populated than that of Bokhara, for the number of dots representing villages is inferior. But there may be other reasons for this discrepancy. Either the hamlets round Bokhara are smaller or the map is better, that particular section of the Russian survey being more recent by ten years. It would therefore not be safe



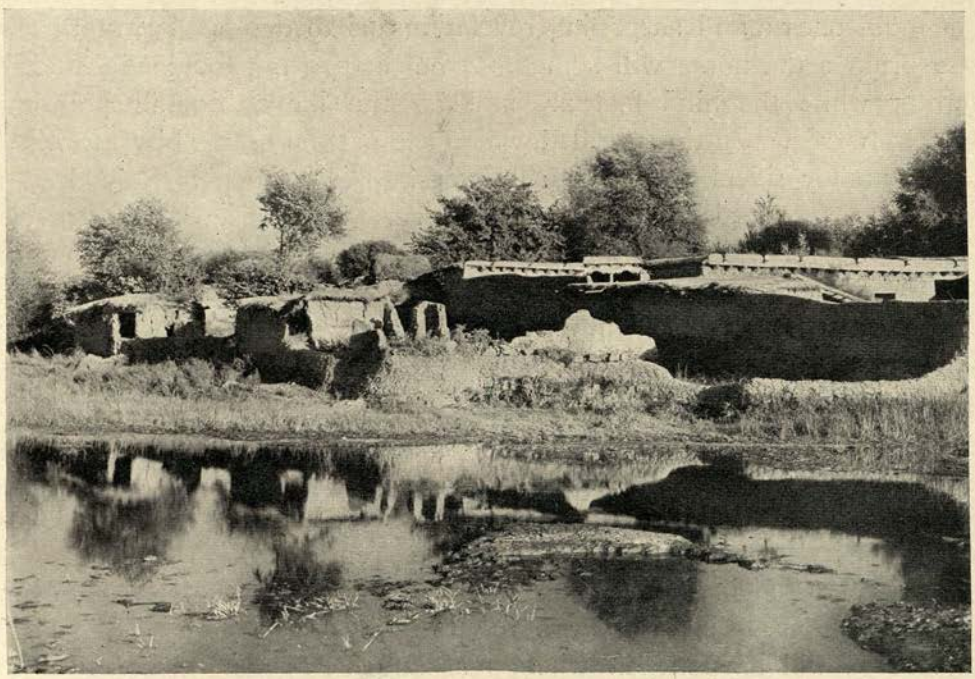
30. Part of the Samarkand Basin.

to indulge in conclusions as to greater fertility and the like. As the Bokharan authorities do not issue statistics, I have not been able to settle this question.

The small map of Fig. 30 represents a square inch of the Samarkand Valley cut from the larger sheet of the "Zarafshan from End to End." This little square, taken out near Mitan, shows the irrigation system over a surface of 34 square miles (88 sq. km.). The river is the

Ak-darya branch of the Zarafshan and there are 58 kishlaks (villages and hamlets). The heights are given in sazhens (fathoms) of 7 feet.

This rectangular cutting from the great oasis would contain about 12,000 inhabitants, which makes 350 for each of the 34 square miles (135 per sq. km.) included. This is of course an average, the figures rising to tenfold and more in and near the towns. As we must reckon that at least 2,000,000 people live in this area (Bokhara, Samarkand



31. A typical Village View in the watered Plains.

and Ferghana) it means that only 5700 square miles of the Duab (one fortieth of the entire surface) are thickly settled. In Belgium, which is an industrial country where crowding has practically no limits, the inhabitants number about 600 per square mile (230 per sq. km.).

Such an irrigated plain is a perfect maze of ariks and ditches, roads and paths crossing each other in every direction. In between are fields, groups of trees, villages, also bits of swamp and untilled steppe. Finding one's way is extremely difficult, even more so than on a glacier or among desert dunes, for steering by the compass is impossible

suburbs. Within this circle there are no fields and no open view, the roads passing in between high walls behind which rise the poplars and elms. Their leafy tops flowing together form the ocean of thick verdure that sighs when the breezes play round the tomb of Tamerlane. Here all is one garden divided by mud walls into large and small properties reached by shady lanes (Fig. 32).

Every village has its name but many a one occurs again and again all over the Duab. Such are Juma, Denau, Agalik, Sari-assia, Mitan, Peishambe, and many others. They are general words recalling some peculiarity of situation or the first settler's happy thought, or may be that of his first caller.

32. In a Garden at Samarkand. Karagach and Poplar Trees.

The Zarafshan being a longitudinal river which has gathered strength between two parallel mountain chains, the irrigation system of its prime is like the network of arteries and capillaries of the human body, more especially as many of the veins flow together again. For the sake of comparison I have also drawn a plan which resembles the roots of a tree (Fig. 34). The Sokh river leaves the Turkestan (Alai) range at right angles intent upon joining the Jaxartes. Coming down such a short valley, it cannot have collected much water, which is at once tapped and used up as it issues from the mountain gate. Distribution is made easy by the fact that the Sokh has built out into the plains a vast, gently sloping cone or fan. Owing to this formation of the ground, the last water can drain away instead of forming swamps as in the flat delta of Karakul.

The Zarafshan below Panjikent feeds about a million people. If the Thames suddenly stopped flowing it would certainly be a tremendous calamity but one which can be borne, for nobody need perish. Were

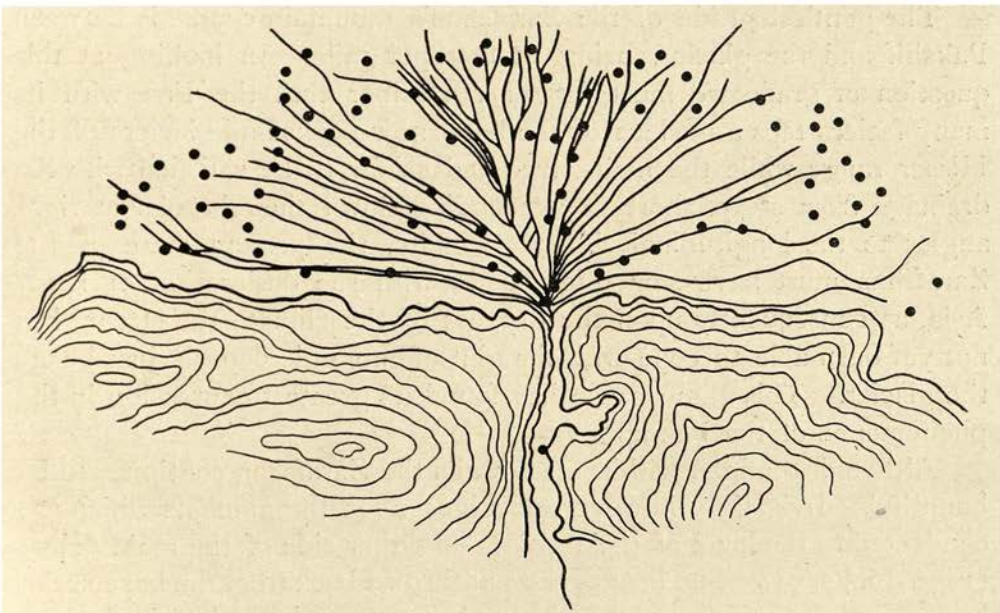
the Zarafshan to be engulfed by the earth the million must either die on their land or migrate, even under modern conditions. The railway might be able to keep them from starvation but not from thirst. The bulk of the population would throw itself into Ferghana, thus causing a general convulsion of the whole of Middle Asia from the Oxus to Siberia and Eastern Turkestan. The Russian troops might regulate this irresistible tide to a certain degree but stop it they would not, unless wishing to kill the natives outright. Even under the most

33. By the Tank in the Palace Yard at Diushambe.

favourable assumption some hundred thousand would succumb to starvation, thirst and murder before being supplied with food or reaching new land. Thus we can realise to some extent how the drying up of the Tarim basin may have been the cause of the migrations of Aryan and Mongol peoples. Of course the events leading to these ethnic tides have not been so catastrophic as just depicted for the sake of argument. But we can easily imagine a state of things gradually growing worse and worse until a climax was reached and a wave of unbearable unrest overwhelmed a region already crowded

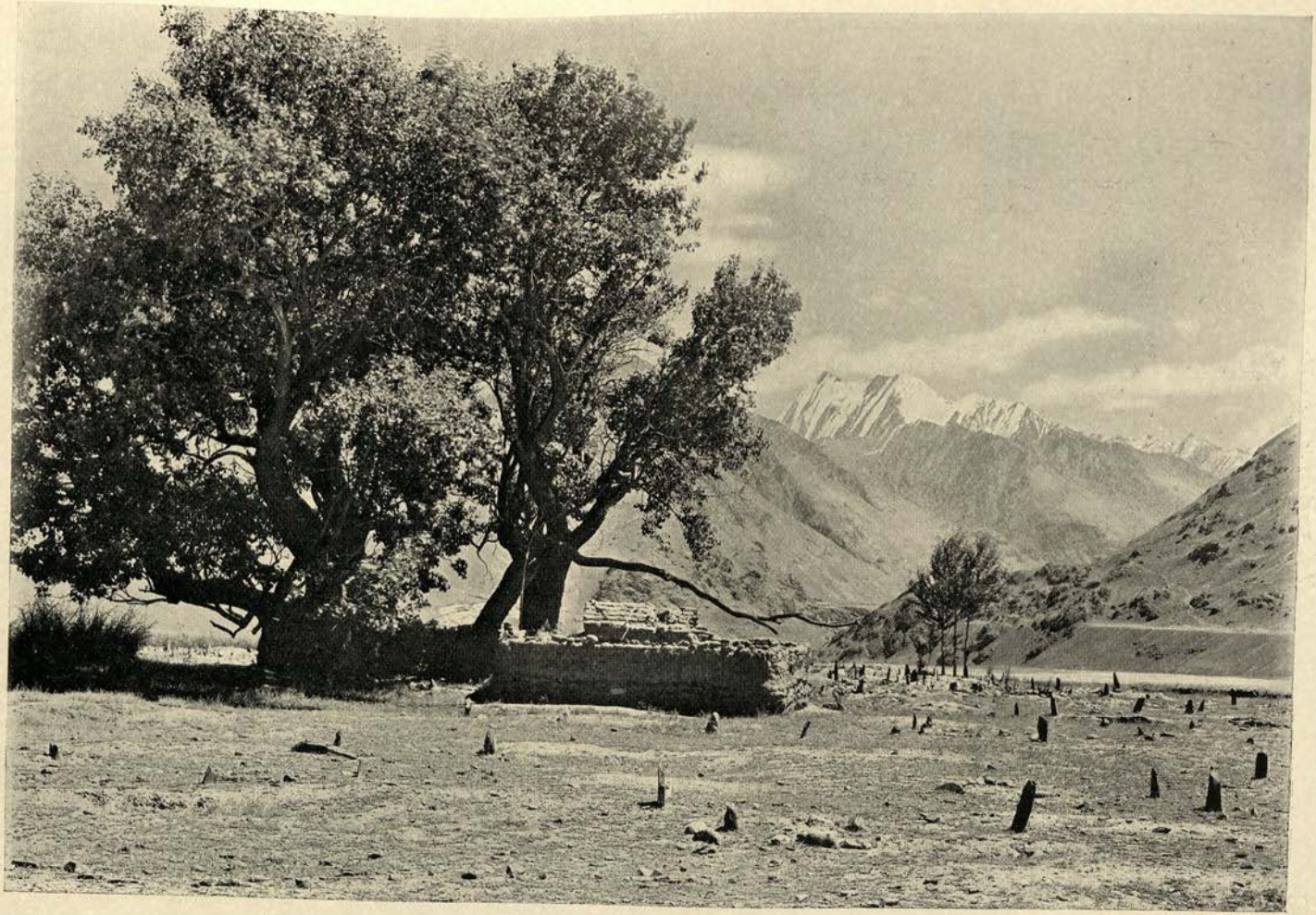
to suffocation. Then suddenly an electrical resolve shook the whole mass of the people, causing them to gather up their movable property in search of new homes.

We now come to the upper course of our river. The Alai mountains (see Fig. 20) split up into two chains called the Turkestan and Hissar ranges, and within their fork the Zarafshan Glacier is situated. The Hissar range again divides soon after the Pakshif pass by sending out a northerly branch known as the Zarafshan ridge. Between this and the Turkestan chain the famous river flows as in



34. Sokh River entering Plains of Ferghana.

a trough of stone, giving what is perhaps the best example of a herring-bone valley in the whole world. Owing to this symmetry the Zarafshan possesses no proper torrential track distinguished by the antics of cataracts and waterfalls. From both sides short tributaries unite simultaneously so that we cannot follow any main feeder into steeper gullies. The great glacier, also formed at once by lateral affluents, has scooped out a broad valley during the ice age, afterwards providing an enormous quantity of morainic *débris* which were spread the length of the river. Thus the Zarafshan obtained a very even grade from end to end. Unlike streams of the branching tree system this herring-bone is



35. On the Upper Zarafshan, The Mazar at Khudgif.

The Zarafshan is only a small river but it works very hard, carrying water at great speed and with unfailing energy. Its importance is enormous and the poetry of its name, which means the Strewer of Gold, is not to be traced to the few miserable grains of yellow metal found among its gravel, but should be taken as a symbol of the benign influence of the River of Rivers.

36. An Aqueduct; Upper Zarafshan.

The wars between the kingdoms and states of the Duab, especially those between Bokhara and Samarkand, were nearly always water-wars and chiefly around the ownership of the Zarafshan. Once the Russians had taken Samarkand, they controlled the waters of the Zarafshan, thereby holding 'twixt finger and thumb the vital artery of proud Bokhara.

in this one respect we still were mollycoddles, that our training was sadly deficient in matters suffocatory and odoriferous. Nor could charitable souls understanding our plight—had there been any—have helped us, seeing that all the double windows were tightly screwed down.

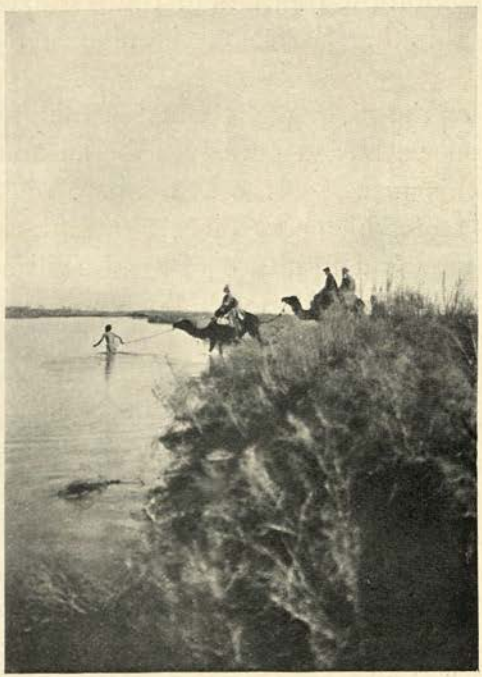
After Carruthers had swooned once or twice we came to the conclusion that our hand baggage wanted re-arranging. When by common effort we had lifted a heavy gun-case nearly up to the rack it slipped, swayed frantically and getting beyond control went through the double plate glass with a terrible crash. Curiously enough, in spite of its great weight, we managed to save it from falling out of the

37. Ferry across the Zarafshan.

train. A hubbub followed, but everybody was compassionate, pitying us for being obliged to sleep near the influx of cold air caused by the regrettable accident. After having agreed to pay for the damage we sat down with a clear conscience, a breeze playing round our temples, and the happy feeling that the question of ventilation had been settled without disagreeable discussion. The conductor tried to keep out the chilly blasts by unscrewing a double window and fitting it into our gap, but wide cracks remained and supplied us with the modicum of oxygen necessary for the maintenance of our lives.

Late at night we arrived at Yakatut where the platform lay lonely and in inky darkness under the glittering sky of the steppe. Down in

blue of the sky. The bare trees shone at times a rich violet, the steppe itself was tawny coloured, broken here and there by patches of green. From amidst this coloured ocean arose at intervals kishlaks whose mud walls made yet another variety in the landscape. As the day drew on the distance became enveloped in a thick, soft haze of dust. Masses of faint, fleecy clouds appeared here and there, the light grew feebler, the colours still less determinate. Only the softly flowing Zarafshan still reflected the blue of the morning sky as it rolled on ever nearer its appointed doom.



38. Fording the Makhan-darya.

At Yakatut the Zarafshan sends out two branches, the Gujeli and Makhan daryas, and our destination was the triangular space between them (Map II). For this purpose we had first to cross to the northern bank of the main river, afterwards recrossing the right prong of the fork. This complicated route was imposed upon us by the fact that the Zarafshan is unfordable at this season even down here, near its end. Naturally the ferry connects the villages on both banks to the north of Yakatut, and not the desert and swamp on the right bank with the thin line of villages between the river and the railway.

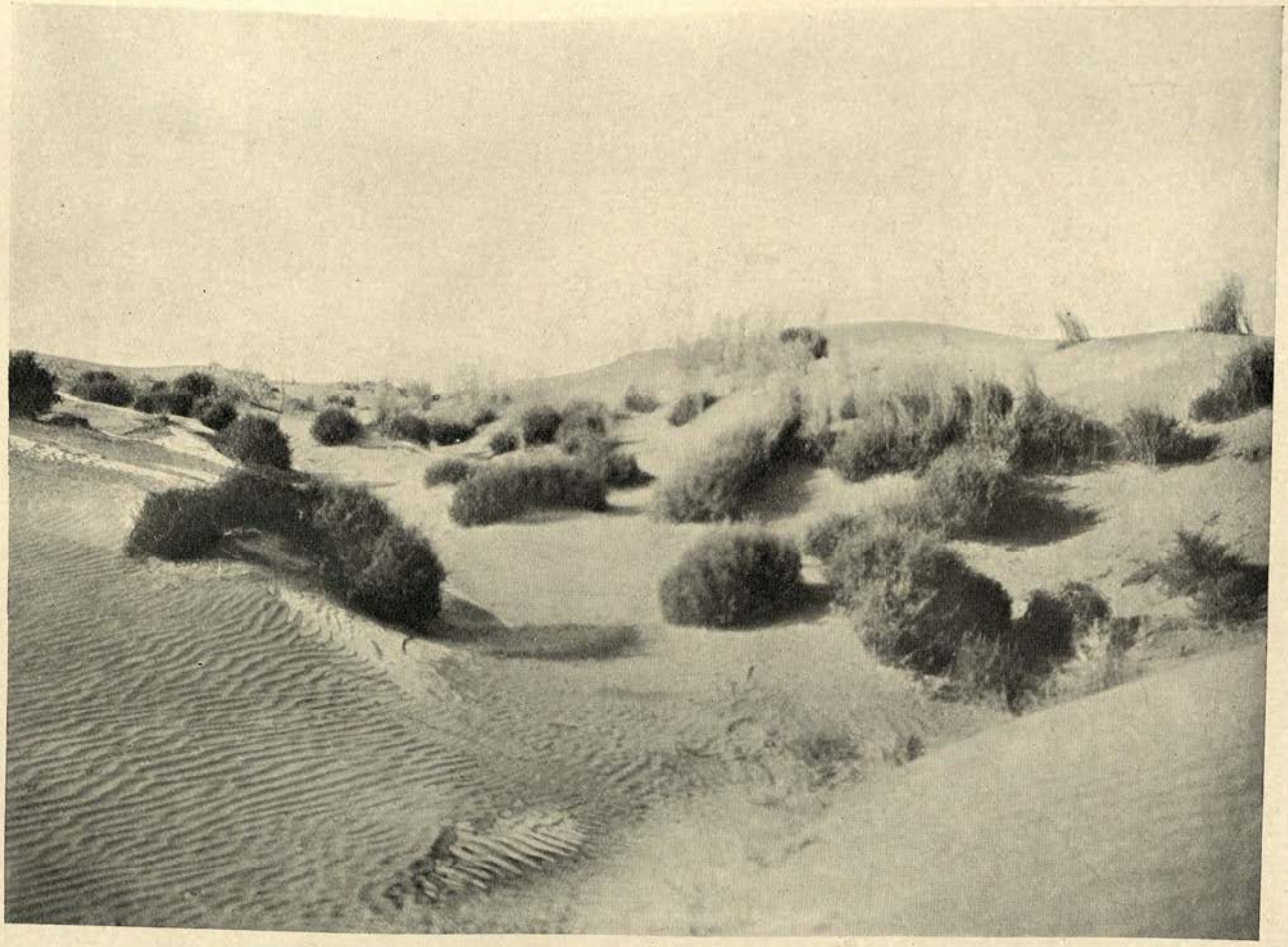
We found the Zarafshan a very deep, narrow channel between high dams. Its waters were swift and slaty. The reason for this periodic swelling of the river must be sought in the plains, not in the mountains; in a decrease of demand and not in an increase of supply. The waters of the Zarafshan still keep circulating through a multitude of ditches but only for the wants of man and beast in the hundreds of villages. All fields are left dry and as it is they which

39. Clay Steppe of High Weeds; Dunes in the Distance.

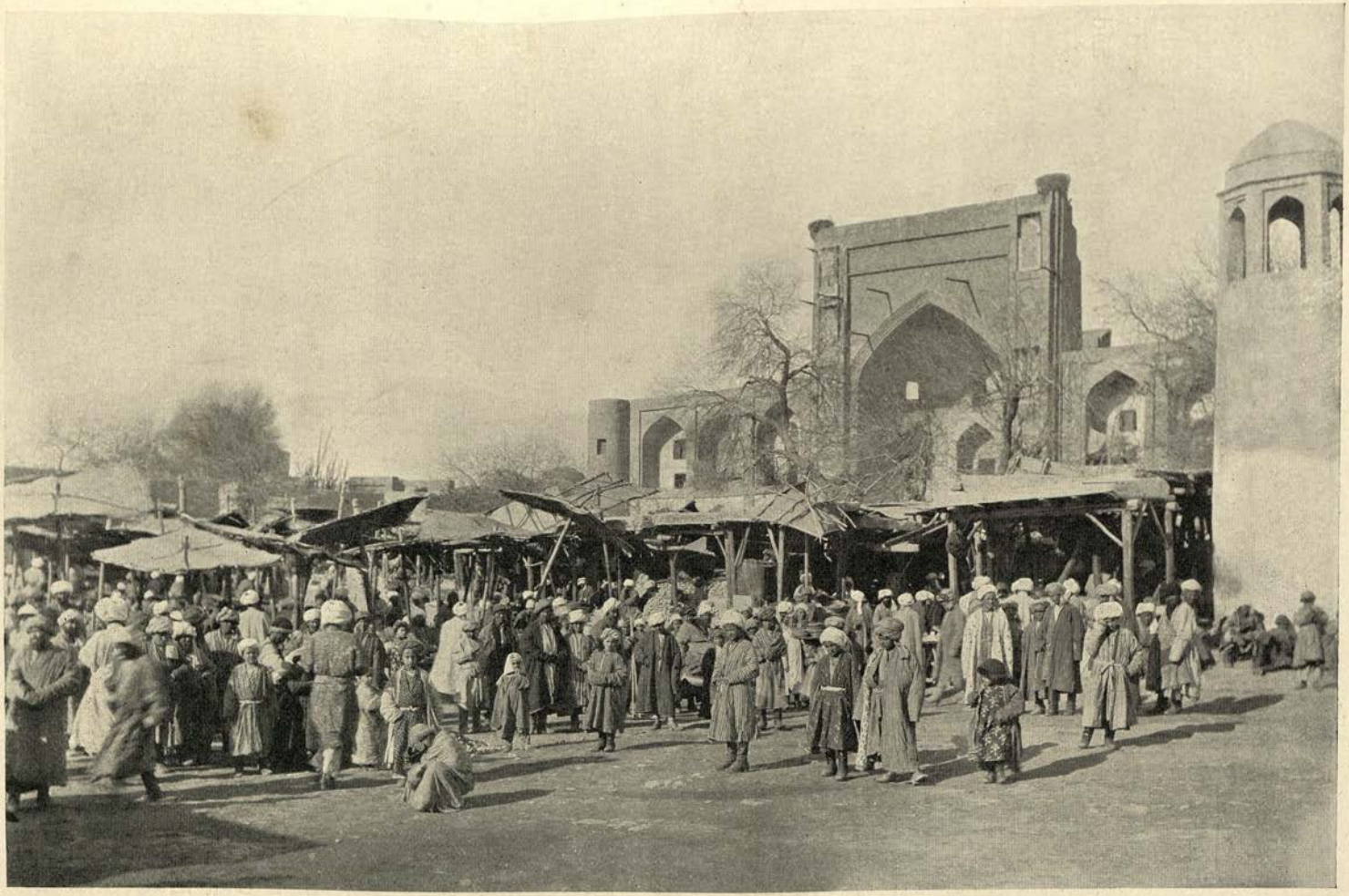
40. Dunes of the Sand Steppe near Camp III.

41. Camp III, Looking North.

42. Sand Steppe.

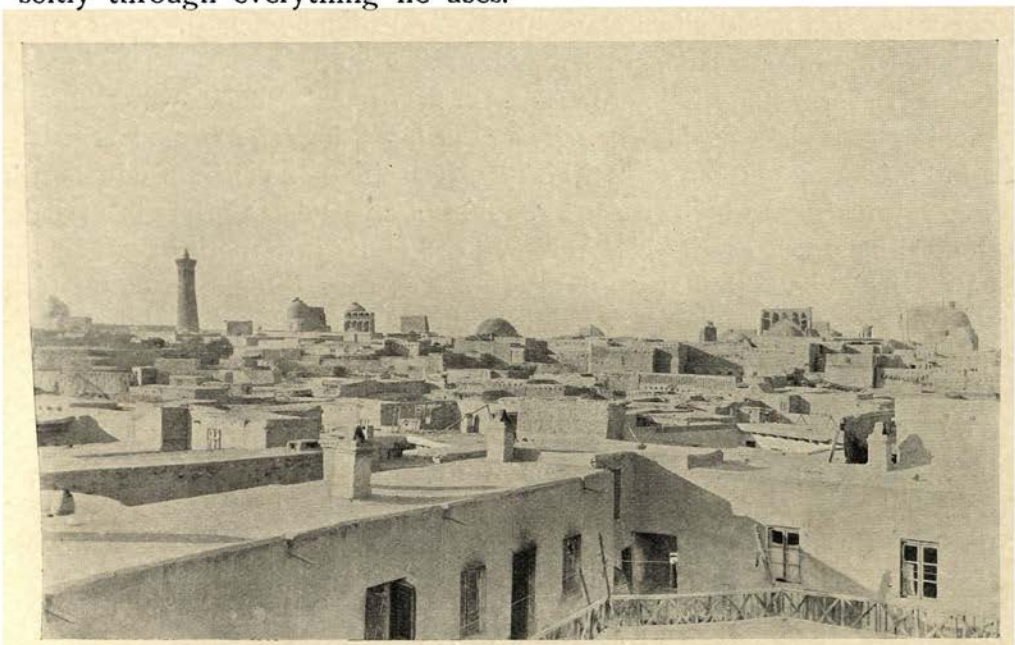


43. Vegetation on the Sand.



45. On the Rigistan at Bokhara.

who rules supreme over the internal arrangements, even were she to remain invisible forever. But there is no mistress; there is only a lord and master, and she the upper servant with no authority. Hence we miss those little touches of which we men are hardly ever conscious, but which we appreciate thankfully all the same. There is no soul of the home making every part of the house an organ of expression, welcoming the stranger with flowers on his table and speaking to him softly through everything he uses.



46. The Roofs of Bokhara.

The reduction of furniture to an absolute minimum has given the Sart a most enviable training. He can sit or sleep anywhere; he can write with pen and ink standing up, holding the paper in the palm of his hand; with the exception, perhaps, of liquids he can tie anything into bundles which he stores in a nook or bunches about his person; his fingers he uses as daintily as we do a fork or spoon. The putting of one thing to many uses plays as great a role in Bokharan civilisation as the inventing of special instruments does in Europe. The time which we spend keeping things in order is probably time saved by the Sart which we see him employ in the pursuit of rest or talk. Here

and watch the result, which will be a fine, rich effect to be remembered by at least four out of your five senses for the rest of their existence.

Nearly every Sart can cook and he is able to cook anywhere. All he needs is an iron pot and a support, which is quickly made out of clay or can be bought at the bazar in the shape of a tin tube. Most of the cooking, even in winter, is done outside, in a verandah, backyard or garden. Often have I watched a bachelor on his little balcony in Samarkand preparing the evening meal over a small charcoal stove. After supper everything had vanished, the kitchen into a corner, the food to its orthodox destination. So there is no scullery full of things gradually growing into a neglected, nauseous collection of smells and messes, such as is observable in the poor quarters of a European city or, worse still, in a Russian hotel of the Duab. Altogether the natives live very much in the open air, also admitting it freely to their houses, no matter how cold it is. Not even with the poorest have I ever found that musty fusty, thick and greasy stuffiness of which the European peasant is so enamoured.

47. The Turquoise Cupola; Bokhara.

Although there are accumulations of dead matter and dead men inside and outside of the cities, no refuse stagnates in the house. The Bokhara house-wife or house-man has no stock pots, or flour bins, or anything, in fact, resembling a larder, only a few dry goods such as tea, sugar, spices and sweetmeats being kept in the house, with the addition, perhaps, of some bottles of jam. Even the wealthy live from hand to mouth, so to speak, buying their provisions when needed. What is prepared is eaten up at once, the wives, servants, the servants' friends,

London city is done by talking coupled with the fine art of "pumping." The market prices of Bokhara are the outcome of bazar gossip. To a people which has no newspapers gossip is a necessity, nay, almost a dictate of self-preservation. The Oriental talks with a purpose, with a full consciousness of what he is saying or wishes to say. His mind has a forethought for every question and an afterthought with every answer. The system of our detectives, cross-examiners and diplomatists is a daily practice with which every native is familiar. How could there be so much verbal tradition unless the same thing was repeated over and over again.

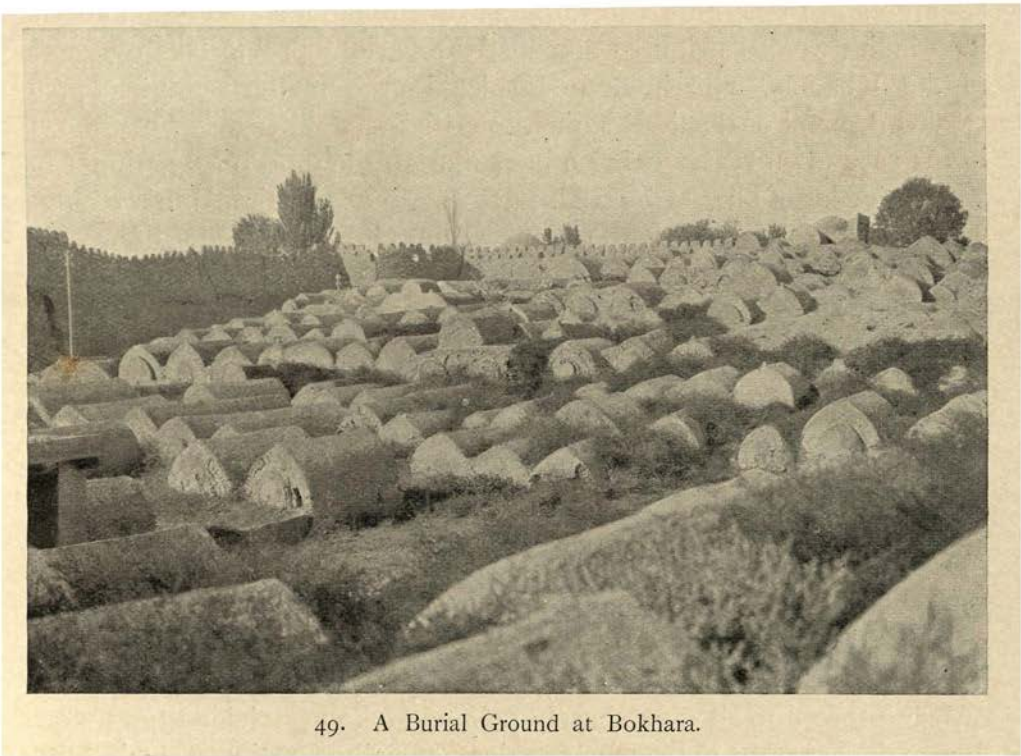
A man with news is a man with something valuable in his possession which will secure him hospitality, friendliness, food wherever he goes. If a Kirghiz has news he gallops off to an aul twenty, thirty or fifty miles away, sure of being received with open arms as an honoured guest. Hardly have the listeners absorbed the gist of the narrative than one of them sets off intent upon capturing a new audience. This explains why in Asia, under equal conditions, native news is quicker than European information; why gossip from Kashgar to Bokhara travels faster than a courier; why bazar talk at Samarkand reports an incident at Tashkent much sooner than the telegram sent to the morning paper.

48. Listening to the Reader.

When we see some merchants of Bokhara sitting together for an hour or more they are simply reading their *Times* after breakfast; when a messenger or servant on his errand catches up snatches of conversation in the bazar, calling out inquiries, he is reading a paper in the train; when a group of listeners sit round a lecturer at the corner of a mosque, they are reading their Bible, or their Shakespeare, or maybe a shilling shocker, which gives more shocks for less money and compared to which our yellow volumes are missionary tracts. What we read they hear, and if count were taken of the hours thus spent I do not think that one side can accuse the other of waste

women are not altogether at the mercy of their owners. Muhammadan law, in fact, endows them with certain rights which they can exercise to good purpose.

On the whole the women make the impression of children and in the outlying districts of savage children. This comes of being shut up and confined to a narrow circle without a chance of developing knowledge or independence. They are inexpressibly filthy in the

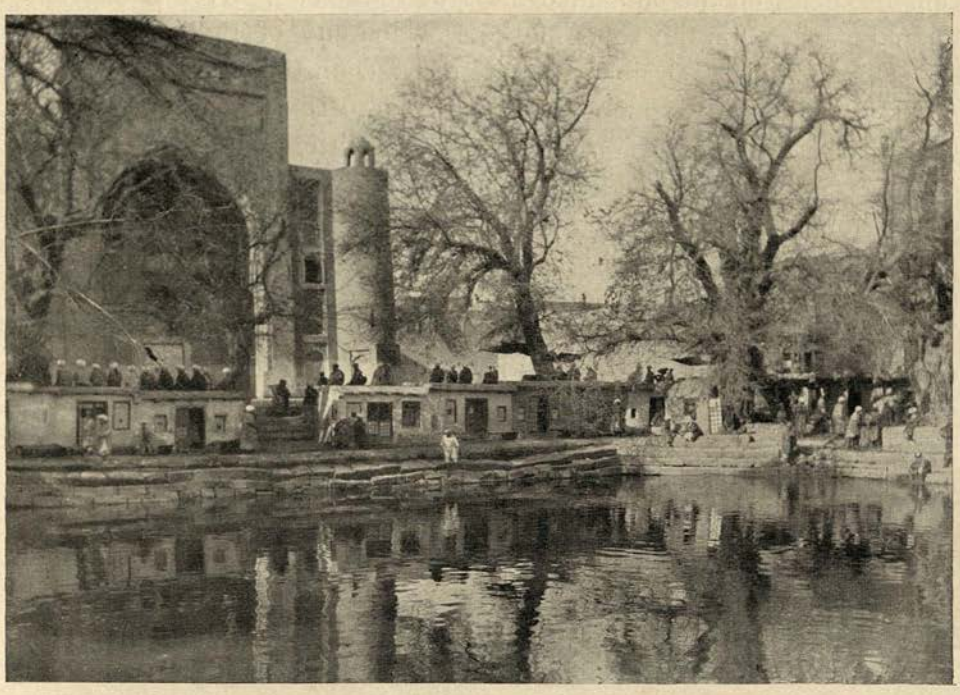


49. A Burial Ground at Bokhara.

villages and are everywhere on a far lower social grade than the men. One may say that the highest woman in the land is inferior to the lowest man. Children they have in abundance but as more than half of them die in infancy, their labours in this department seem somewhat vain. As regards needle-work they are very skilful in embroidery, while poor wives excel in patching, for the garments of the male members of humble families are marvellous examples of this art, and seem in many cases to have been put together by an indiscriminate use of the contents of the rag bag.

not more of a menace to the living must be due to the climate. Part of its wholesome influence we may ascribe to the germ-killing properties of sunlight, though this only holds good where the microbes are not embedded in their breeding medium or kept moist by water. Moreover there is a respite afforded by the shades of night.

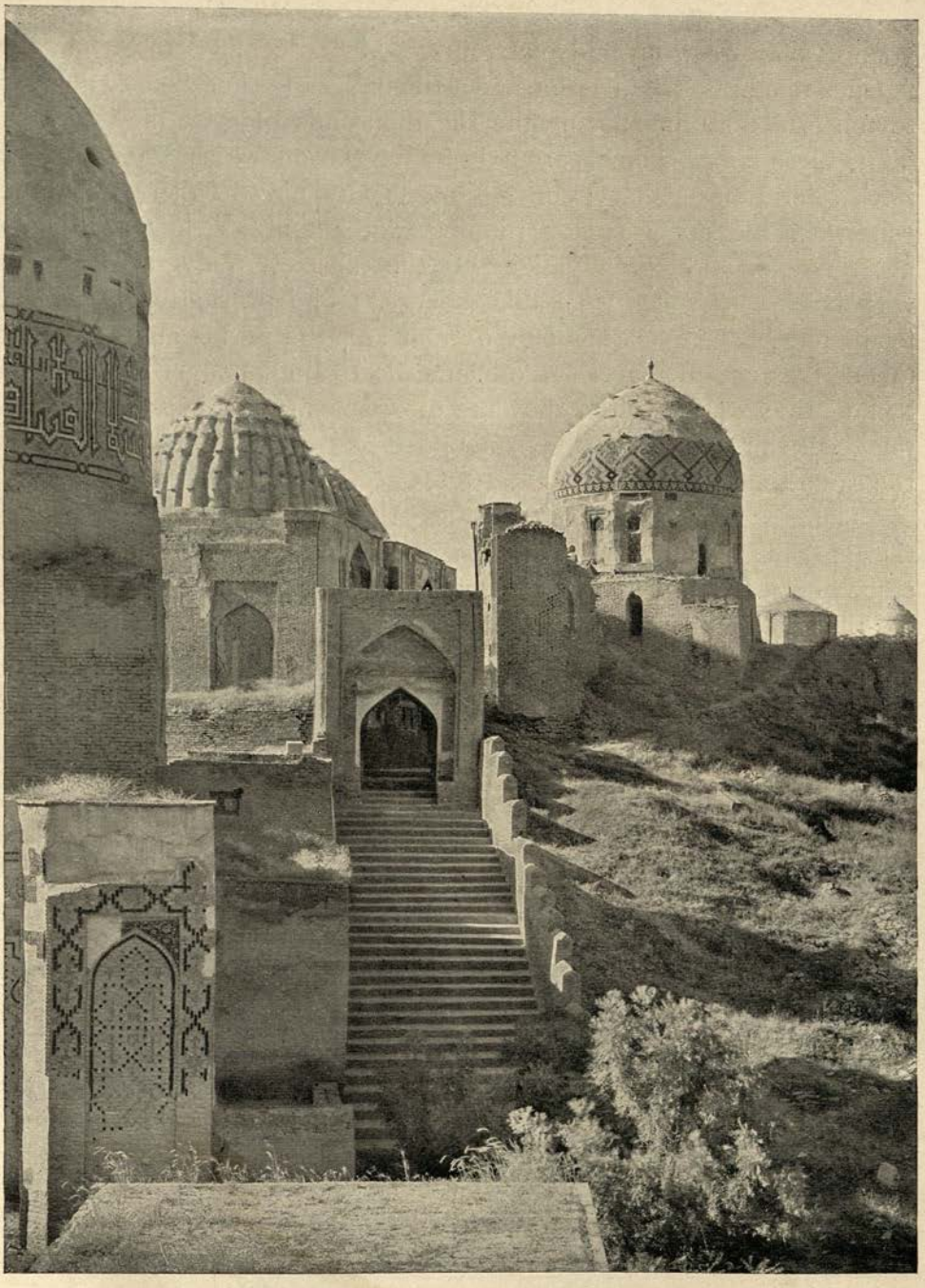
The most important hygienic factor is the general dryness of surfaces which isolates all centres of putrefaction and the refuges of microbes.



50. The Labihauz at Bokhara.

Were it not for religious and moral reasons the dead would probably not be covered at all, instead of being covered as little as possible and exposed to ventilation. At all events they are not "buried." Carcases and refuse left to sun and air vanish, one might almost say evaporate, very quickly in this country, whereas if put under ground they would stew in moisture, heat and darkness, and thus be sure of contaminating soil and water.

We Europeans are simply spoilt in matters olfactory. Eastern cities have proved long ago that frank smells do not represent



51. Shakhzinde at Samarkand.

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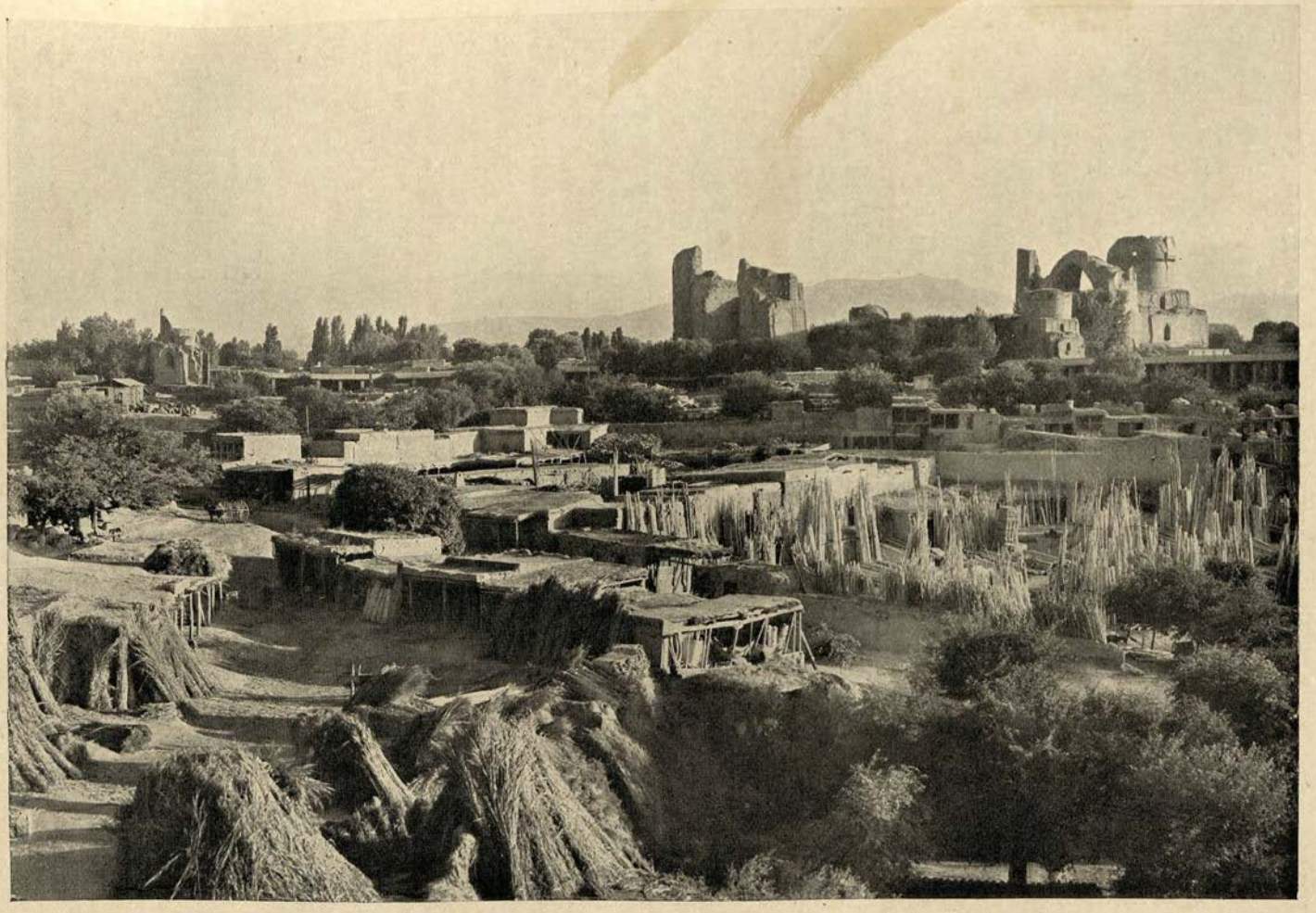
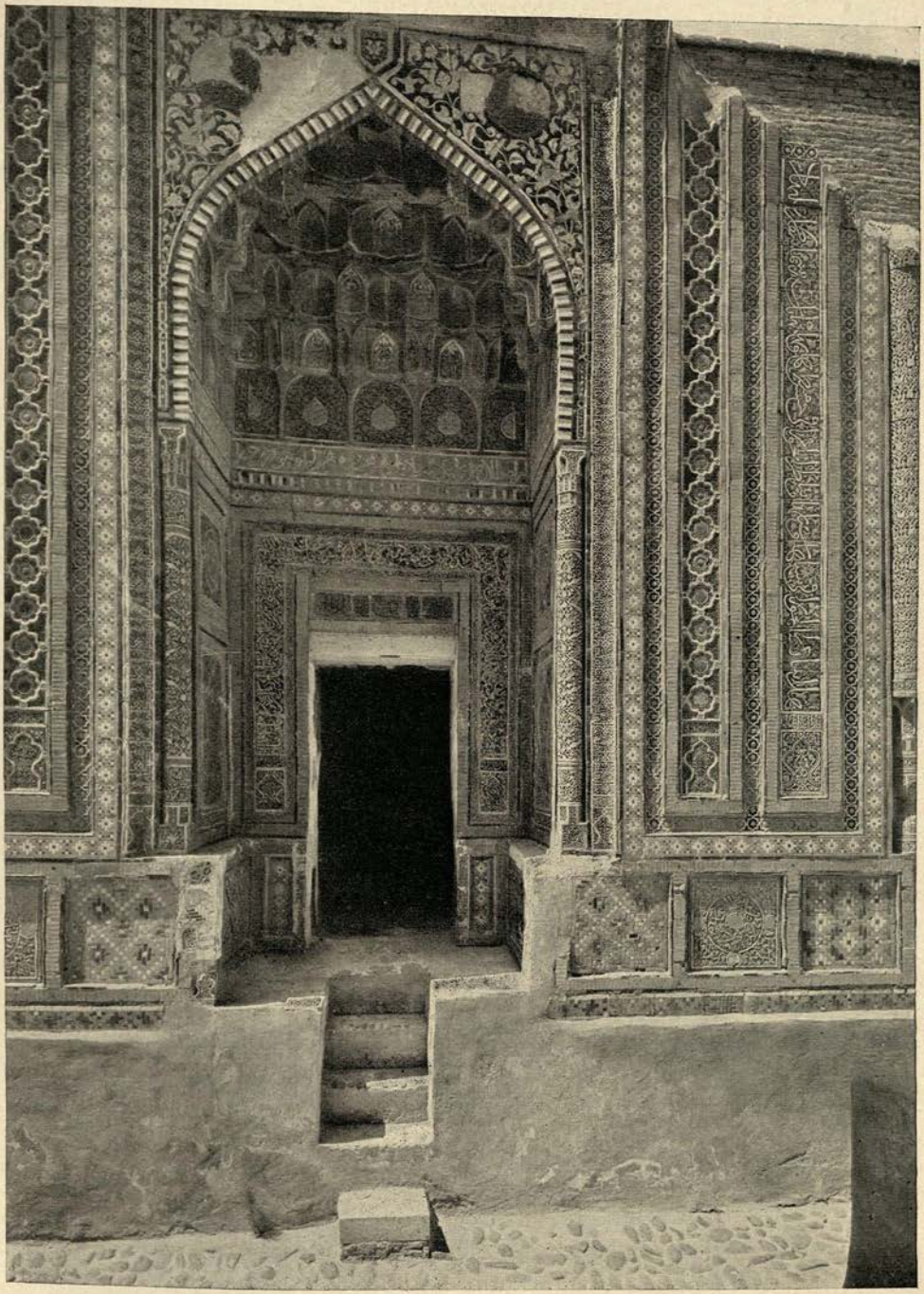
Junipers." How little Russians must care for mountains, when one thinks that up there no summer resorts as yet exist. How would the English have jumped at this opportunity, for little is needed to make the road to Panjikent fit for speedy motor cars. Thence to a spot called Kuli-kulan would be a ride of half a day. Here, at a height of six thousand feet, lies a group of morainic lakes, fringed with juniper trees that are dark and stately like cypresses, and overhung by the rocky terraces and ice-falls of Chapdara. The tarns are fed by rivulets which meander over green pasture or lose themselves among thickets of roses and honeysuckle. But the country is still new and who knows if some day a Russian Darjeeling may not be founded in this lovely spot.

The native town with the mosques and medresses lies amid some broken ground cut out of a loess shelf by gullies and irrigation canals. To the west it is dominated by the old fortress whence a fine view may be obtained of the monuments around the Rigistan. A sharp eastern boundary is formed by the plateau of Afrosiab, where on the edge of a cliff over the reed bazar we can judge of the erstwhile magnitude of Bibi-khanum, erected by the great emperor to the memory of his favourite wife (Fig. 53). The buildings must have been magnificent beyond description, judging merely from the dilapidated portions of them which remain. Five hundred years of exposure have as yet not dimmed the lustre of the colouring on the glazed tile work. Turquoise and ultramarine still glow in their pristine splendour in every variety of pattern on the fast decaying domes. The arabesques adorning the walls with their graceful curves and the originality of their designs are a constant pleasure to the eye. In looking at the edifices of Samarkand one comes to the conclusion that, intentionally or unwittingly, the greater care or skill was expended on the external decoration. The glassy enamel of these wonderful tile mosaics is incorruptible, still showing a hard and fresh surface, while the masonry has come to the

52. A Boulevard at Samarkand.

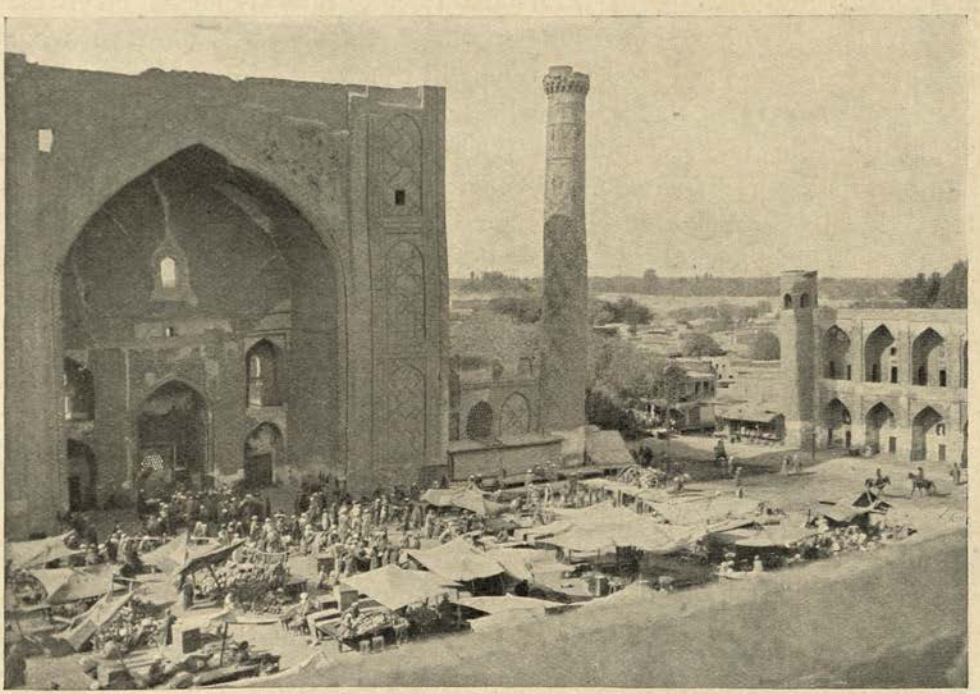


53. View from the Edge of Afrosiab. The Reed and Timber Bazar with the Ruins of Bibi-khanum.



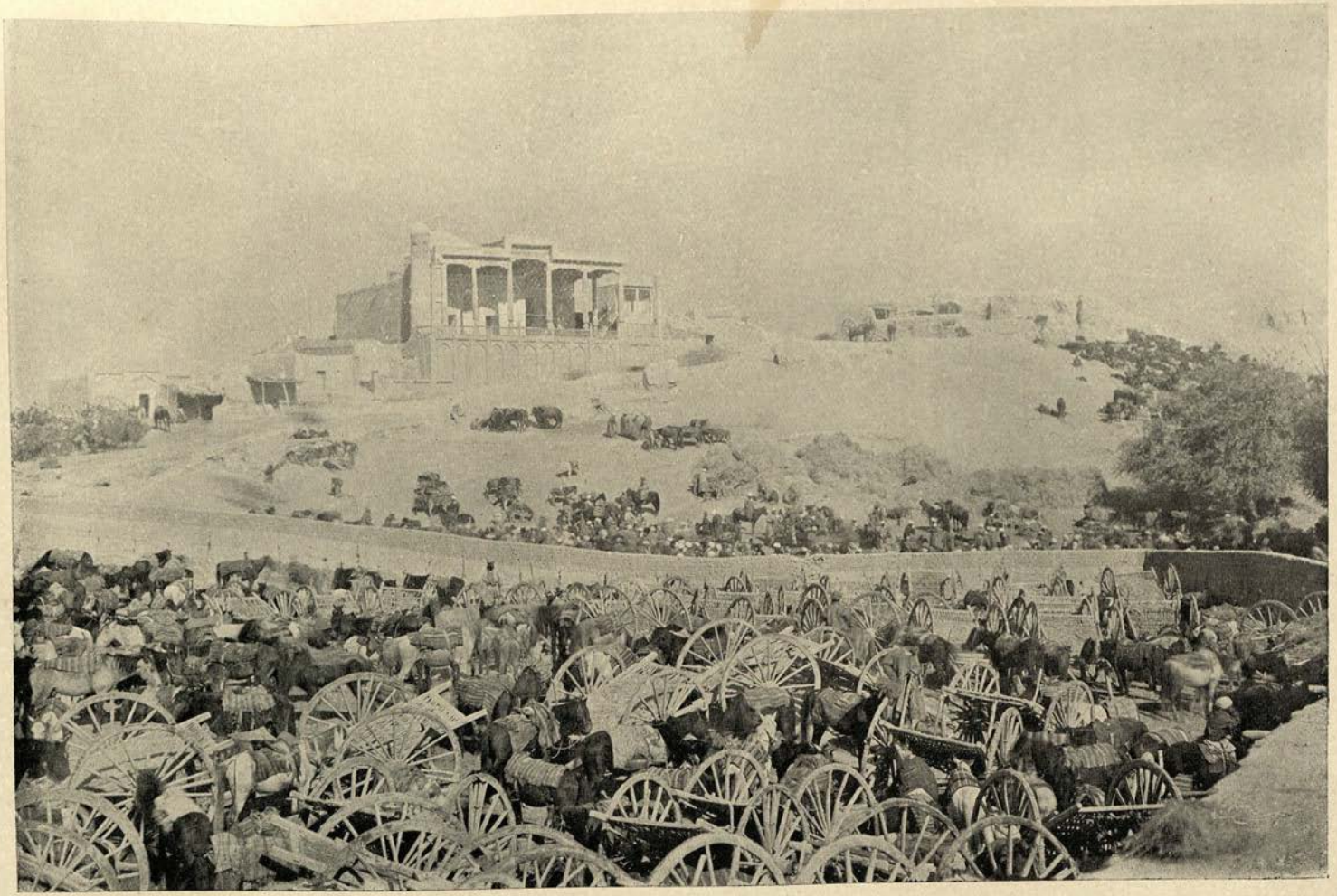
54. Ornaments of Glazed Tile in Shakhzinde.

of distinguished bones, are surrounded by the collapsing vaults of minor mortals. Many layers have here succeeded each other, some of the dead with tombstones and offerings, some of the living with houses or workshops. The whole of Afrosiab is full of remains from the days of Bactria to recent times, and with every step one kicks a fragment of the past. In some of the ravines potsherds, glass and coins can be found in great numbers carried thither by rains and spring floods, thus representing what might be called anthropological sedimentation. In

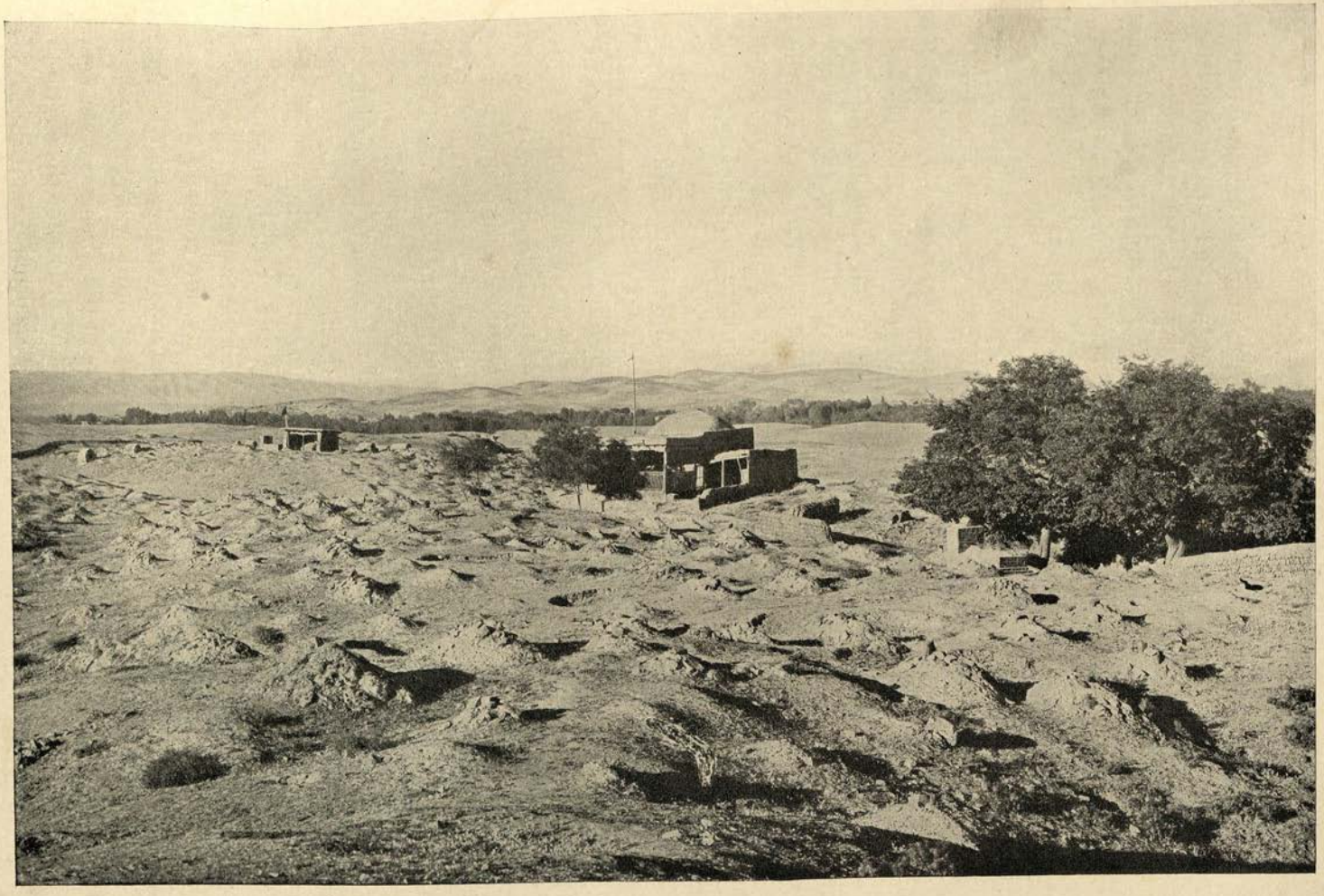


55. The Samarkand Rigistan with the Ullugbeg Medresse.

other places I have noticed ruined walls partly buried under loess in historical times. Take all the crockery and china of London, Paris and Berlin, smash it to pieces, mix it with two or three million cubic yards of clay and bricks and bones, such is Afrosiab. Everywhere one comes across holes where men have dug after coins and unbroken vessels or the hordes of pariah dogs have burrowed in search of well-preserved bones. We seem to sniff the odour of centuries, but on pursuing it come to the vultures' club, where brownish-reddish lakes of blood uplift their stench

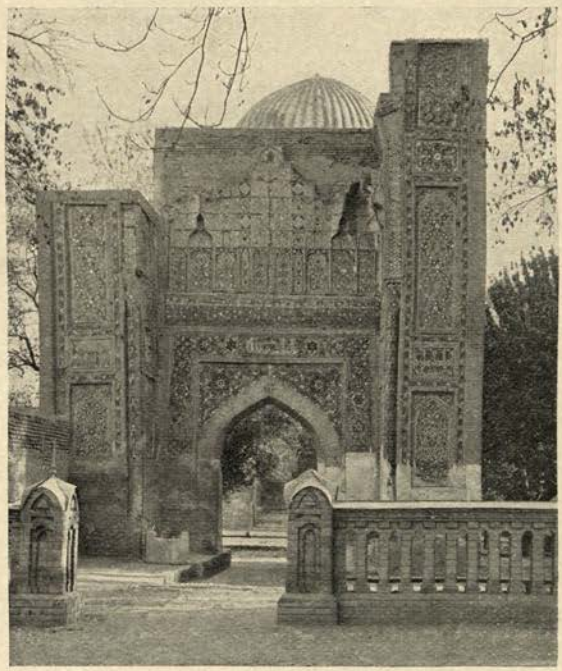


56. Bazar Day at Samarkand; the Carriage Depot.



57. Afrosiab ; Looking towards Chapan-ata.

which are always unconsciously present to me and which I apply indiscriminately on the spur of the moment are: the well-to-do Anglo-Saxon, especially when he is also with-nothing-to-do, who is the maximum of cleanliness; the Polish Jew, who is absolute unsavouriness; and thirdly, an estimation of a kind of just, general average of international sweetness. The Sart represents this inter-racial more or less clean and dirty condition, being dirtier than the Englishman and very much cleaner than the Polish Jew. My wife in reporting

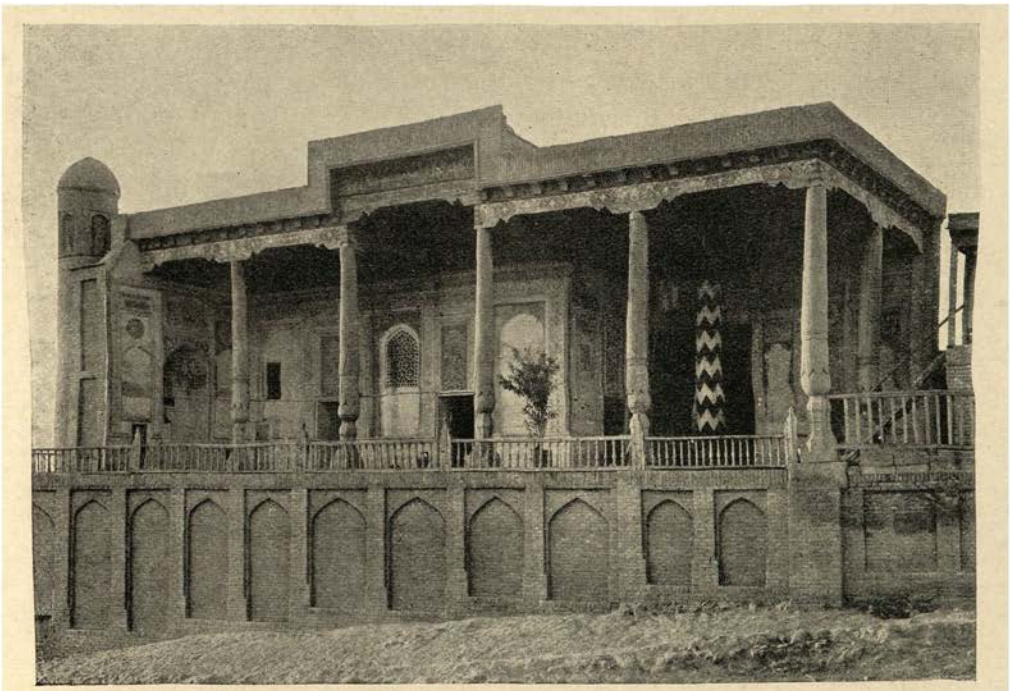


58. Gur-amir, the Tomb of Tamerlane.

the women and their quarters dirty, naturally had the nearest comparison in her mind, that is to say the men and their rooms, thus characterising the women as a lower grade within their surroundings. Should I ever call a Sart dirty it will be on account of certain individuals or special habits such as the drinking of tainted water.

While at Samarkand we lived in a native house for some time. A complete property of the inner districts generally consists of the dwelling house, a pond shaded by big planes or karagach (elms),

from Samarkand. Carruthers collected many small birds, most of them being varieties of species familiar to English people. Starlings, gaily coloured wood-peckers, and that jewel on the wing, the bee-eater, were among the most conspicuous of the feathery tribe. During spring the clumps of trees were swarming with cuckoos evidently on their way north. Near our house was a rotten tree in which our sharp-eared naturalist discovered a company of bats, betraying themselves by their chirping. Having watched the hour of their



59. A Modern Mosque at Samarkand (Hazrat-khaizar).

nightly appearance we held a butterfly-net over the hole and managed to catch six while another twelve made good their escape.

Knowing Samarkand at all seasons of the year I can only speak favourably of its climate, which strikes me as being the best of any large city in the Duab. The short spells of rainy season, chiefly in March and April, are disagreeable merely on account of the unfathomable slush to which they reduce the roads and courtyards. July, August and September are almost without a drop of rain. The

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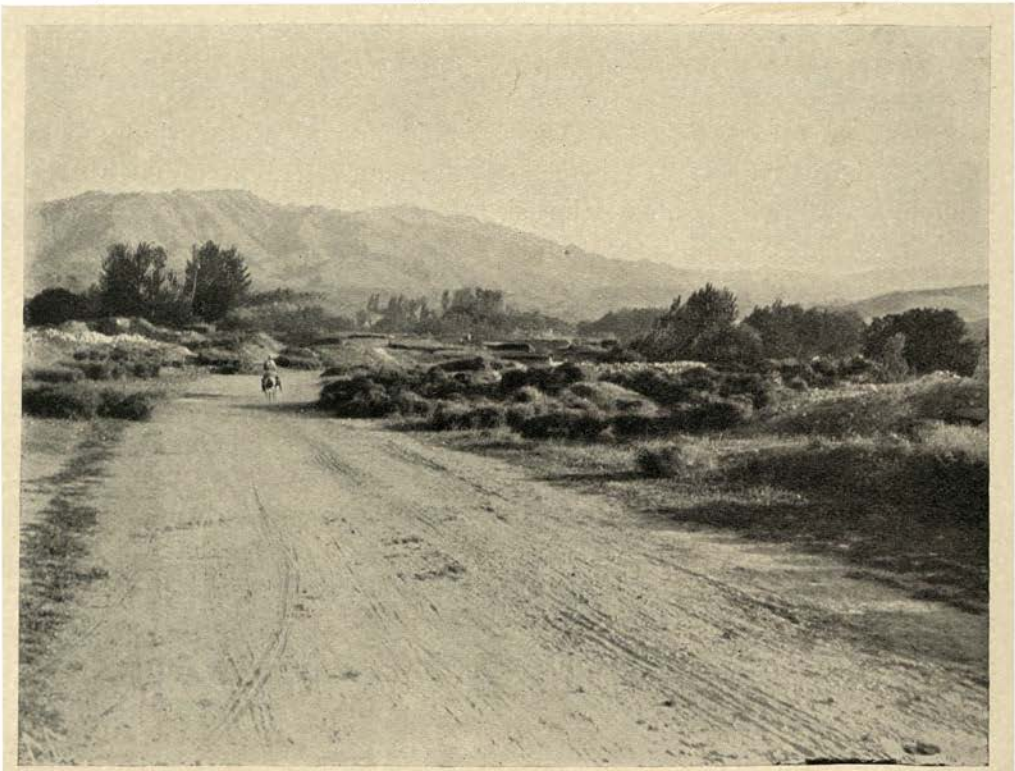
Samarkand; at Northampton there would be five hundred, at Charing Cross at least five thousand. Although not over clean and often held together by bits of rope, they have springs that seem to laugh at any bump under three feet high and a load under a ton. As long as the road is just wide enough, the crests and hollows of its waves not more than six feet apart, and the river ford not deeper than to the horses' necks, the driver will take you anywhere and without notice, if the



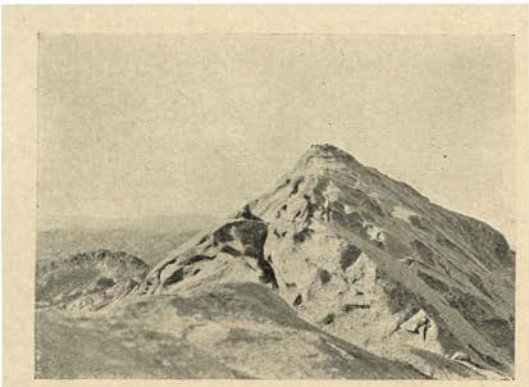
60. Agalik with Kemkutan.

distance is under ten miles. Unmindful of obstacles the two lean horses keep up a gallop most of the time and the native Jehu has a very quick eye for the estimation of depths and angles. In spite of violent lurches among the breakers or a heavy list from shifting cargo I have so far not been capsized, although it once was my happy lot to get stuck in the mud owing to a giving out of motoric force.

In October 1907 we made our first attempt. As far as the Dargom Bridge (see Map II) the road passes through the garden country, but

our feet sleep myriads of creatures, innumerable species of insects with their eggs or larvae, many reptiles, and several kinds of amphibians and rodents, all awaiting the call of Baldur's wand. When the steppe has donned its garb of spring there is much creeping and crawling, buzzing and humming by day and by night, and the steep banks are alive with bee-eaters, swallows, rock-pigeons, falcons flying to and fro from their nests, to be relieved, after sundown, by owls and bats.

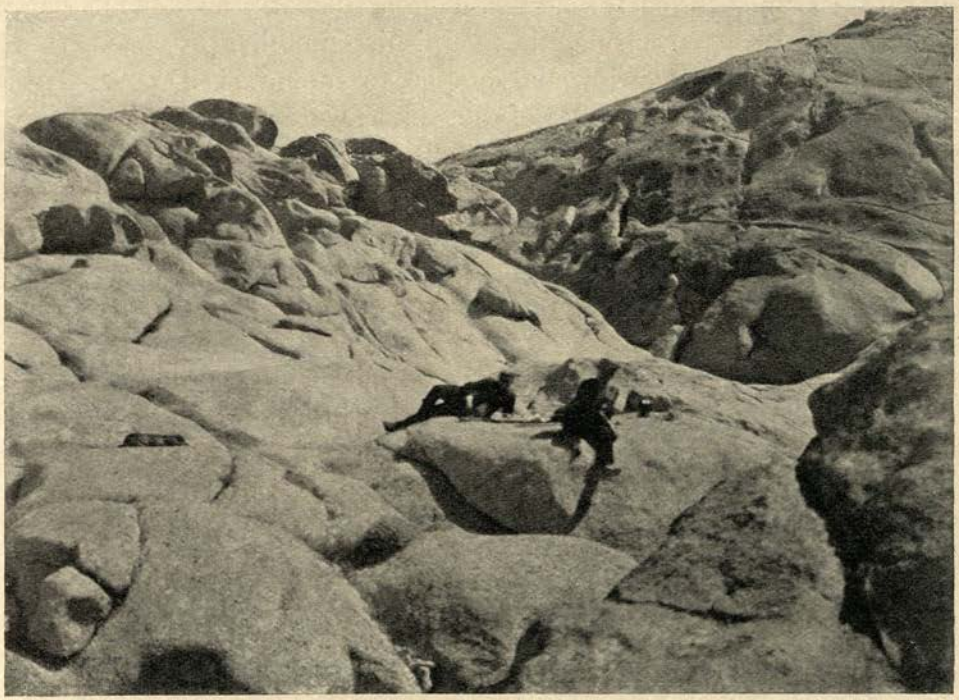
On our way we see small hills from forty to sixty feet high, rising out of the flat surface and conspicuous from afar. Known as "kurgans," a name occurring frequently in place names, these hillocks are too big and shapeless to be ruins of buildings, too soft to be remains of denudation by water. Hence they must be artificial mounds such as were made in the olden days around the important towns. Declarations of war were not customary in those times and every city had to be on the guard against surprise. But as the plains offered no view points these kurgans were heaped up to serve as watch-towers, and they were most numerous in those directions whence an attack was most likely to come. Thus a long line of such look-out knolls extends from Tashkent for fifty miles on the road towards its old enemy Kokan. At present they are generally occupied by a buzzard or hawk surveying his hunting ground.



61. The Top of Kemkutan.

The first sign of dense vegetation is a small garden in the steppe watered by what remains of the Agalik river after having passed the village. A Russian is trying to cultivate this plot of land which has become his own on the strength of the old law, which awards all land to him who first reclaims it. It does not seem to thrive very well, however. And hereby hangs a conundrum. Why do the inhabitants of Agalik live inside the somewhat stony valley where scant space and an uneven surface must make tillage and irrigation difficult? I have asked some of them, to which, of course, they replied that there was

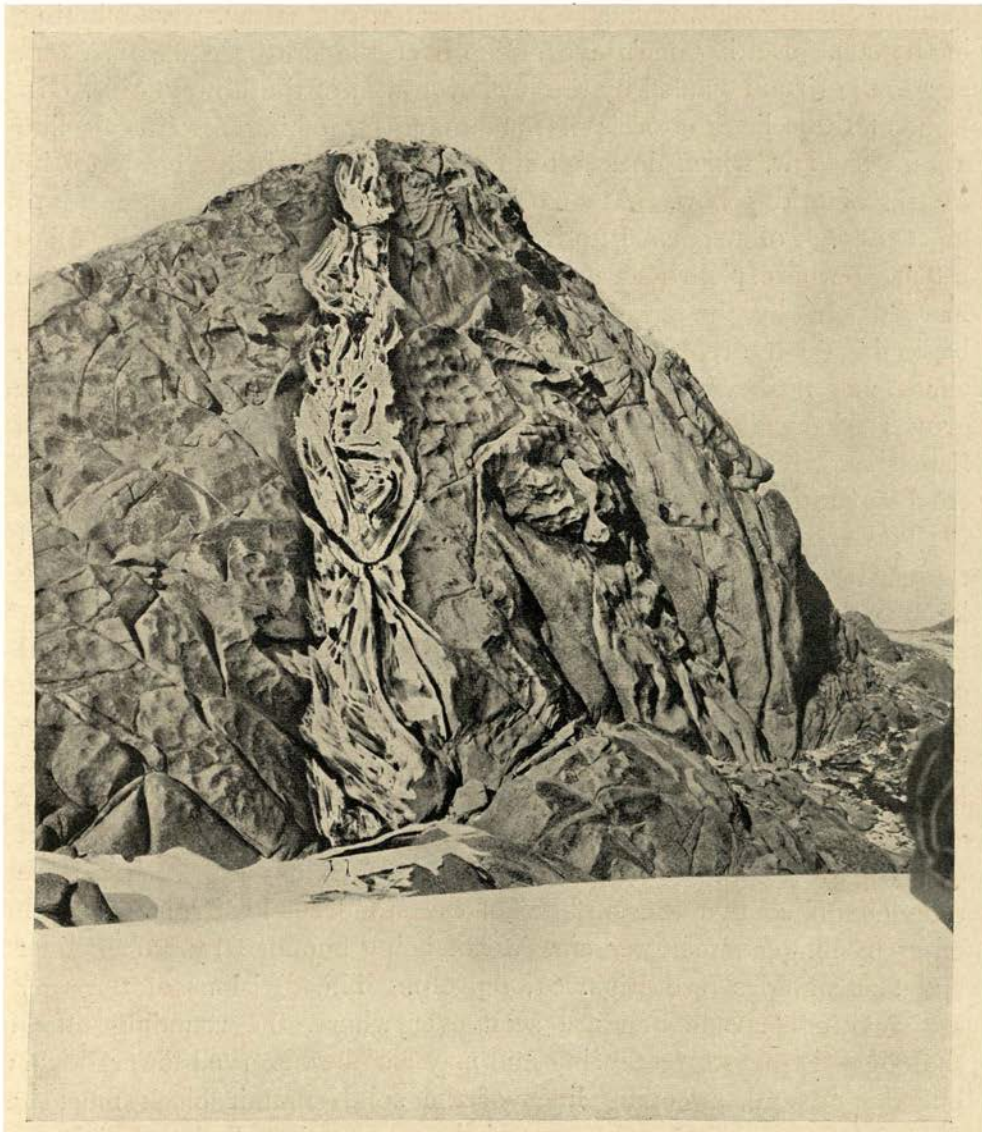
that there is no permanent snow, and there had been practically no rain since the end of May. But granite is a good water-holder owing to its many fine clefts which retain a considerable store allowing it to percolate slowly. In order to get some idea of this capacity we might calculate as follows. From Kemkutan to the plains is two miles in a straight line, so that this mountain dominates a plane surface of sixteen square miles. Allowing for valleys, etc., this block contains about three cubic miles of granite, a third of which drains towards the Agalik river.



62. Among the Rocks of Kemkutan.

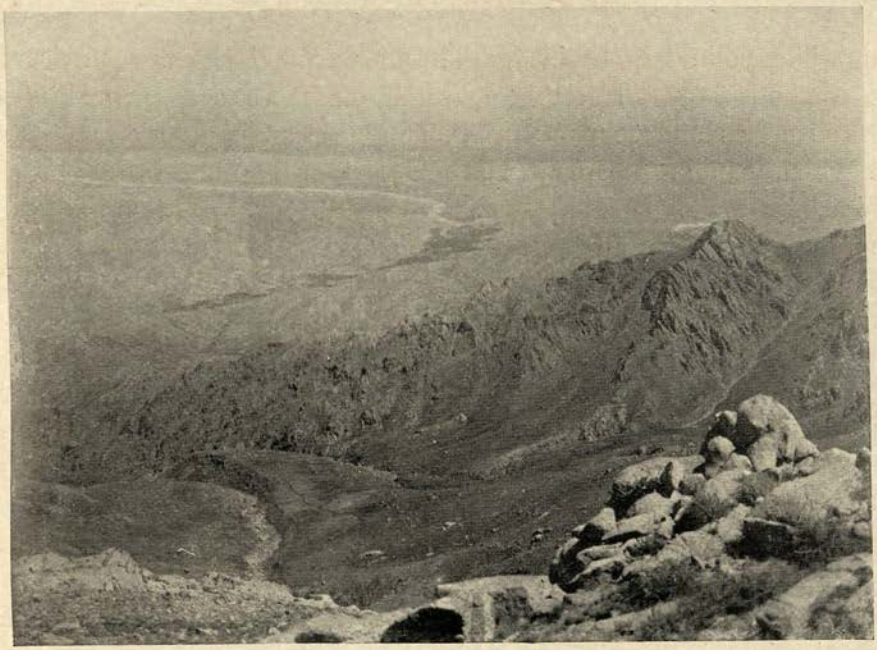
This cubic mile has a total of internal surfaces of 7000 square miles, if we assume that the granite is not cleft into blocks smaller than half a cubic yard. Then we obtain, in round figures, 20,000,000,000 (twenty thousand million) fissures of one square yard between two walls. Each of these clefts can hold, let us say, one cubic inch of water, allowing it to flow together slowly. This gives seventy million gallons or a steady flow of eight gallons per second for three months. In this manner one can easily understand how it is possible that absolutely

assault, to which Kemkutan capitulated on the 16th of December 1907, at noon, this being the first time man had set foot upon its crowning crest.

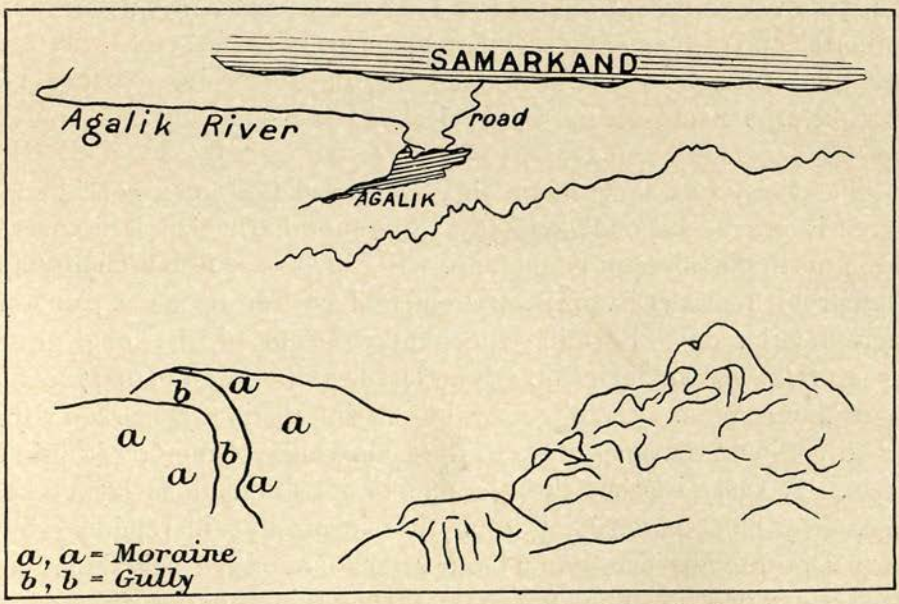


63. The Summit Rock of Kemkutan.
(*A flaw down the middle of the photographic negative has been repaired.*)

The clear view was magnificent. First we turned towards the east, where the great peaks of Hazrat-sultan stood fiercely above the



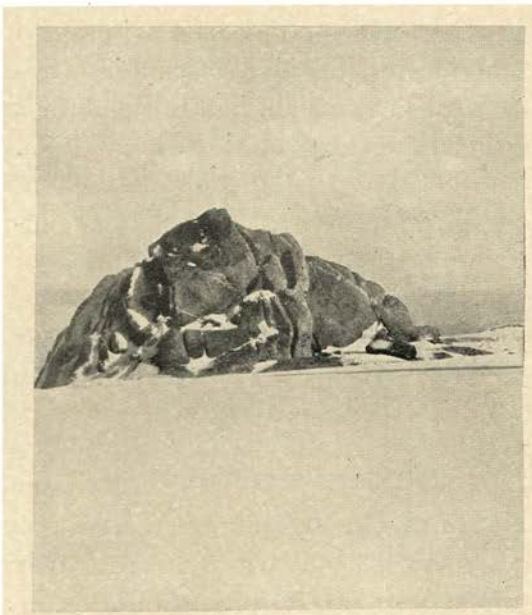
64. View towards the Plains from Kemkutan. For locating the Moraine compare with Fig. 65.



65. Diagram explaining the View of Fig. 64.

a dry climate, whereas a moraine does so very readily, turning into grass-steppe in the Duab. The larger and longer a glacier, the more conspicuous its great forms become in the landscape; the more distant and complicated the road from source to end the more independently the glacier works, the less its role as an intermediary, the grander its own creations out of the raw material. Even an expert might overlook the Kemkutan moraine unless he was on the watch.

As to when this moraine was built, whether at the Günz, Mindel, Riss or Würm period, I cannot say with certainty. While it is easy to trace morainic or fluvio-glacial deposits on the higher mountains of the Duab this becomes despairingly difficult low down or in the plains on account of the thick covering of loess which hides the different features of the underlying ground. Nor have the known deposits of higher levels been classified, owing to the small number of observations. Thus we have no base in the plains like that afforded by the Bavarian layers of morainic material discovered and explained by Penck. Unless one has the whole scale, identification is very speculative. But assuming that the Alpine and Duabic periods ran parallel, against which there is no serious indication to the contrary, so far, we may venture a careful guess. According to Hess the last glacial period in the Alps (Würm) was the coldest with the lowest snow-line. For the Oglio Glacier in the Eastern Alps he puts it at about 4000 feet (1200 m.), while to-day it lies at 8200 feet (2500 m.) on an average, so that on this basis we must ascribe the Kemkutan Moraine to the Würm period. Simple as this may sound I record this opinion under protest, for there are many complications to be considered. To-day the Duab



66. A Nunatak on the Kemkutan Plateau.

spine of the system is one uninterrupted hog-back, sometimes laid out in fairly regular zig-zag, with a branching spur at each corner of the rampart and a cairn, like Kemkutan, to mark the spot. One had only to imagine this winding monster covered with a thick back-cloth of snow with white flaps, shreds and tassels hanging down into the folds of its wrinkled withers. I cannot for a moment believe that considerable changes have taken place in the relief of these mountains since the last glaciation. The stream which has furrowed a trench through the old moraine has not yet scoured the bed-rock to

67. New Snow on a Ridge of Kemkutan; looking East; Kughi-surkh in the Distance.

any appreciable extent, while the gorge which I have mentioned may owe much of its depth to the glacier stream, the erosive activity of which went concurrently with the heaping up of the glacial detritus. Some of the larger currents of water may have gnawed vertical gorges into the granite, but the denudation of the hillsides, of broad surfaces must have been practically nil.

Descending towards Agalik we soon entered the region of boulder cascades. Where the granite was not polished by ice to resist weathering, and where, lower down, it is not covered by turf, many steep tiers and ravines have been reduced to gigantic piles of stone.

smaller, until at the edge of the crest, we see crippled individuals doubled up with an incurable stoop acquired from the wind.

After many hours we came to a confluence of two streams, and choosing the left or larger one we gradually got to high and open pasture ground alive with natives and their herds. It was too late to climb the final ridge, but we obtained a good idea of the country. The surroundings were quite alpine at this time of the year, patches of snow still lying on the divides and undulating folds of emerald coloured grass sweeping down to the noisy torrent. Here we made a fire of pine cones which we had brought from Samarkand and boiled our afternoon tea.

68. The Plateau of Kemkutan; looking East, towards Panjikent.

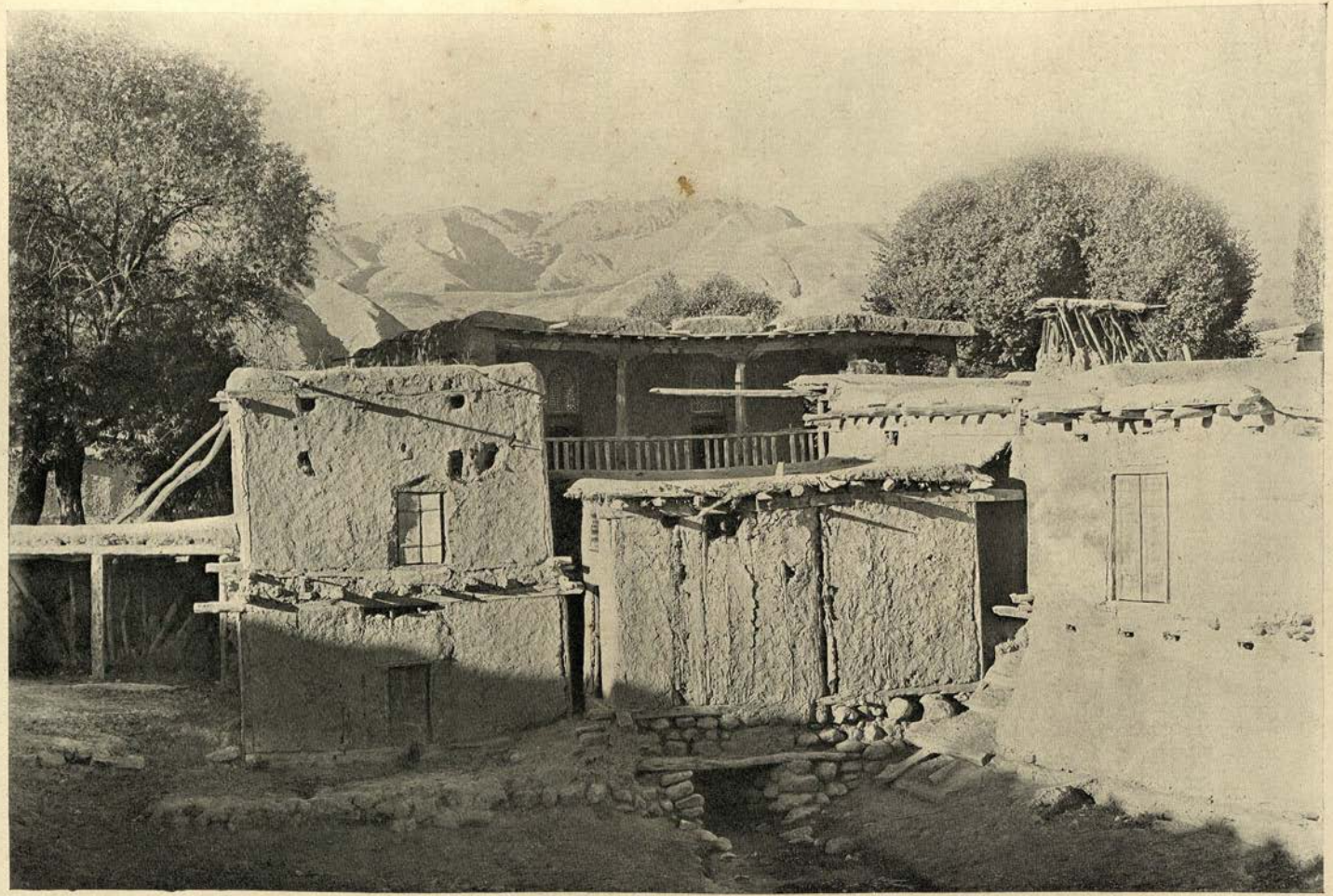
Looking at some of the summits it seemed to me that one or the other might easily be higher than Kemkutan.

When we had returned over the worst part of the road someone suggested that we should make a night of it, for the sickle of the moon was already fairly fat in the pale sky and would shed sufficient light on the homeward track. At a nullah which seemed lonely and deserted we alighted and left our horses in charge of our servant. Here the grass was already parched or eaten and much to our disgust we found the trodden circles indicating the former position of a hut. Pools in which water collected had been covered up very carefully with sticks

and stones in order to keep earth or small animals from falling into them.

Near the summit of the ridge we discovered three groups of huts, hidden in basin-shaped recesses among the reefs and bars. These were inhabited by a motley crowd of ragged men, women and children, but they were very friendly, calling off their dogs and inviting us to step near. A few thin tricklets of water were flowing here from springs among the rocks; in one corner there was even a willow tree and the camp looked very picturesque indeed. On the wet soil I found many naked snails. In the air were a few vultures, and kites descended quite close to wrangle over a bone with the dogs. A few hundred yards further was the top of the broad back of the range, where we enjoyed a wonderful sunset. Blood red the orb of day sank down between yellow streaks, casting his last lurid rays upon an ascending spur beset with teeth and looking like a saurian monster with dorsal spines climbing up from the steppe at the approach of night.

69. Camping.



70. Loess Architecture.

But still the Zarafshan was rising. The water found many places which gave a level of rest or offered short cuts that avoided the twistings of narrow gutters, while some rills which could not keep pace with the stress of supply made use of the nearest hollow as of a store. The flood was pouring on and the moving water sought to rush the large ariks or wriggle and glide with frantic haste through the network of innumerable arteries, for there was ever coming more. Where it found the winter's refuse or forgotten sods in its bed, or where a damaged dike suggested relief, it eased itself and spread, making marshes, bogs or shallow lakes in which wavy currents betrayed the line of submerged canals. It was not however an angry deluge that boded ill, but merely a congestion of abundance, for much of the land was only drenched with rain, letting the streams pass by in their orderly path.

71. A Karagach Tree or Turkestan Elm.

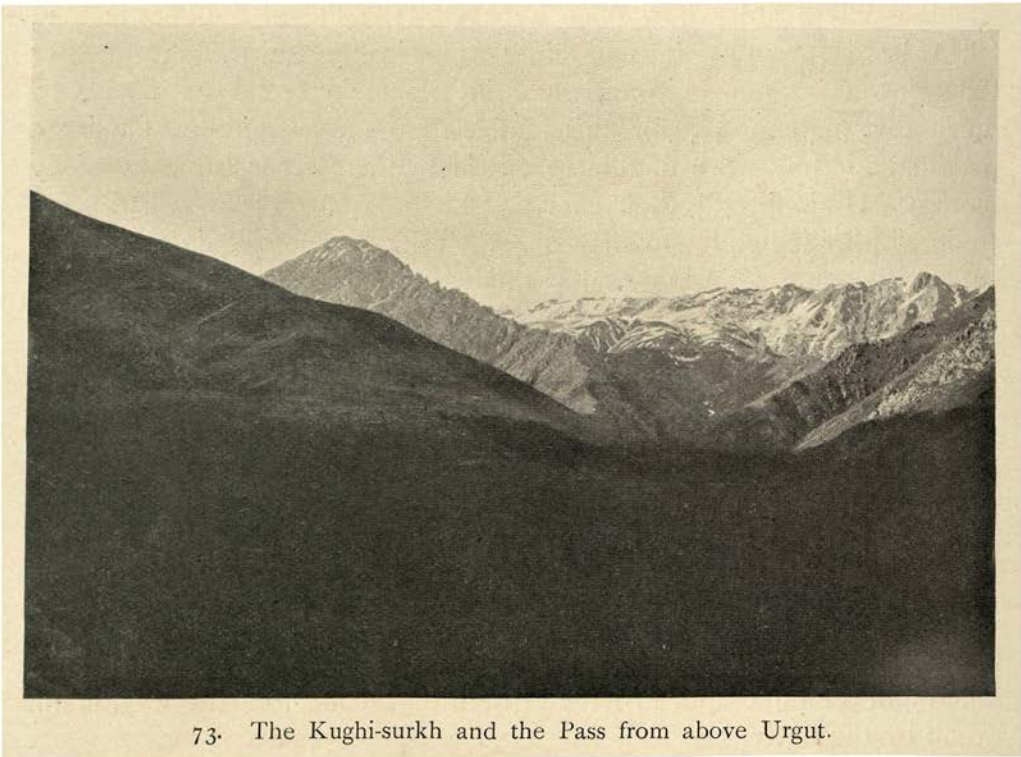
Man now believed the message and Sarts stood in the damp haze with wringing khalats tucked around their hips and drops running from their beards. With ketmen and spade they endeavoured to coax the water or ward it off, made inlets or dams, widened breaches or stopped them, as their case demanded. Everybody saw after his own, so what was public ground depended on the mercy of the gods and to the road they were not merciful. On the whole it was a course of quagmires and bilges of stagnating peasoup, but sometimes it sloped into pools of unfathomable treachery or was crossed by a leisurely stream. All horses had bespattered bellies, saddle-felts were pulpy and riders were sorely bedraggled; camels floundered, their legs went apart, their splay feet slid aside and with the suction of a squeegee drew broad smudges in the mire; people

I mean that condition which the Sarts are in the habit of regarding as normal. Deep mud, hills and dales, six feet above or below the general level, ditches, pools, nothing daunts the immense wheels set so wide apart that a tilt of forty-five degrees leaves a wide margin of safety. Should a felloe miss the edge of one of the many so-called bridges which span the irrigation canals and descend into the water it matters not: a bump, a heave, and out we are again in the smooth waters of the lesser ruts. One follows the line which the cart traffic of the time has decreed as the best, the horse's sailing directions being given by a deep narrow groove just wide enough for its moving feet, and which hundreds and thousands of them have trodden before it. But it may also, in its turn become the inaugurator of a new variation rendered necessary by obstacles.

72. The Sacred Grove at Urgut.

The araba is one of the numerous instances of the best instrument adapted to surroundings. For transport over the roads nothing can surpass it for the ease with which it overcomes rough ground. Anyone travelling in the plains or steppes should use it for his camp outfit, baggage and servants, riding on horseback himself, if he prefers it. If I were a resident obliged to take long journeys frequently, I would have an araba made with strong springs, which would enable me to travel by night while comfortably asleep. We built a thick layer of camp bedding and pillows in order to deaden the jolts, and covered with mackintoshes such of our limbs as went beyond the shelter of the hood. It was raining cats and dogs, and at one place we drove through a lake over half a mile wide, but only three feet deep. Here I thought of the mud-flats which connect some of the North Sea islands with the

always transported in carts. Short stirrups are the rule and a regular trot is never seen, because one either goes at a walk or at a gallop; on journeys a quickened walk is used. The highest prices are paid for amblers, while the trapata (a Russian word) is another favourite gait. It is said that to produce the trapata all four feet are moved one after the other in circular order, not alternately, but although I tried to investigate this point I always found the horse's legs quicker than my eye. One rarely sees the best horses which are those of the Turkoman



73. The Kughi-surkh and the Pass from above Urgut.

breed, said to be equal to the Arabs in everything save beauty. The Kirghiz and mountain varieties are also hardy and useful, but the Sarts generally give preference to the exterior of their chargers, paying fancy prices for an isabella with red eyes or a piebald in the manner of a chess-board.

I have already mentioned the fact how seldom one comes across a restless animal and it also seems curious that tales of horse-breaking and horse-breakers never crop up in conversation with Europeans who know the country, although feats of endurance of horses and

of the leading camel. One often sees him asleep, for through long practice he has learnt to sit far back on the long pack-saddle resting his head on the folded arms in front. In the Duab meet the domains of the dromedary or one-humped camel and the Bactrian or two-humped camel. The former is more frequently met with in the desert, while the Bactrian is found in the cultivated parts and among the Kirghiz, who take it up to the highest mountain steppes. As long as the path is not too rocky or narrow the camel can climb anywhere.

74. The Kughi-surkh from the Pass; looking South.

In very hot districts, especially in Chinese Turkestan the animal is only made to work in winter. Crosses between the two kinds remain procreative and are specially bred in several districts.

In a garden near our sarai we saw some very fine karagach. The karagach or Turkestan elm (Figs. 17, 32, 70, 71, 128) is one of the typical trees of the Duab landscape, chiefly owing to its tendency of forming leafy balloons of great regularity. As the main limbs shoot upwards like a bunch of flowers gradually unfolding near the top, and as the secondary boughs follow this example, the inner

Just beyond the last houses, at a height of about 3500 feet, there is a place of pilgrimage. Sheltered by the canopy of a sacred grove of giant sycamores lies a small mosque with pillars of wood and painted friezes (Fig. 72). A few lonely guardians sat in the outhouses and altogether the place looked somewhat forlorn and dreary in the rain. The great domes of the trees were still a network of brown twigs and sprigs in which the young leaves hung like a golden haze. Storks, jackdaws, starlings, doves and sparrows were busily and noisily occupied around their nests. On the sodden ground, in between rare patches of grass, one discovered numerous heaps of charred wood and ashes, the remains of the camp fires, where the pilgrims had held their picnics. At the upper end of the grove a spring of fine, clear water wells from a fissure and the large pool is inhabited by fish enjoying the protection of taboo.

75. Our Big Tent.

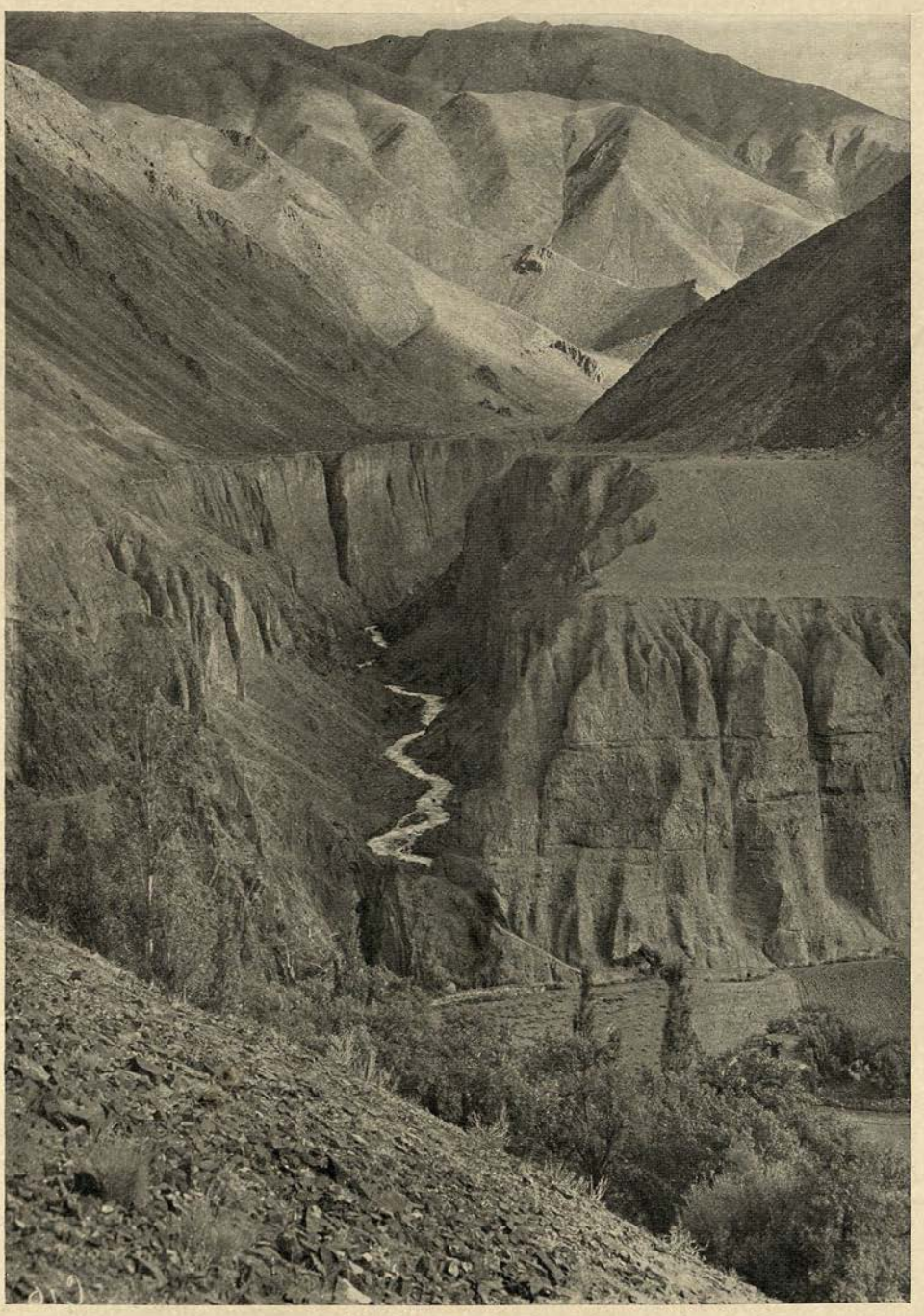
Such places of pilgrimage are nearly always associated with water and big trees, while judging from reports which I have read the "tame fish" are a favourite institution. If this had not been a somewhat sanctified locality I should have asked to be accommodated in the mosque, which would certainly have offered the most comfortable quarters. The reader may be astonished, but in the villages we were very often taken to the meshed as the best house in the place. In the large towns, of course, conditions are somewhat different. The mosque is not really an abode of God, but a meeting-hall. Owing to this the ordinary temple is not defiled by the foot of the unbeliever. Only those containing sacred tombs or shrines are looked upon as consecrated ground. It is altogether the presence of the Kafir which is unwelcome anywhere, in the open as well as inside any house, private or public. Wherever this objection is not or cannot be enforced, wherever the unbeliever is allowed to show his face, the soil of the prayer-house forms no absolute restriction. This may possibly be different in other Muhammadan countries, such as Turkey. But we must remember

being of a dark brown while the older untilled ones wore yellow of many tints according to the crop or the time they had lain fallow. Here and there a single furrow is drawn as a mark of taking possession of this season's ground, for the mountains belong to everybody and the first comer is first served. The reason is that these fields are not properly irrigated but left to the chance of rains. Here, as on the northern slopes of the Alai there is always the reasonable probability of a little rain, because these snowfields are the most advanced towards

76. A Bazar.

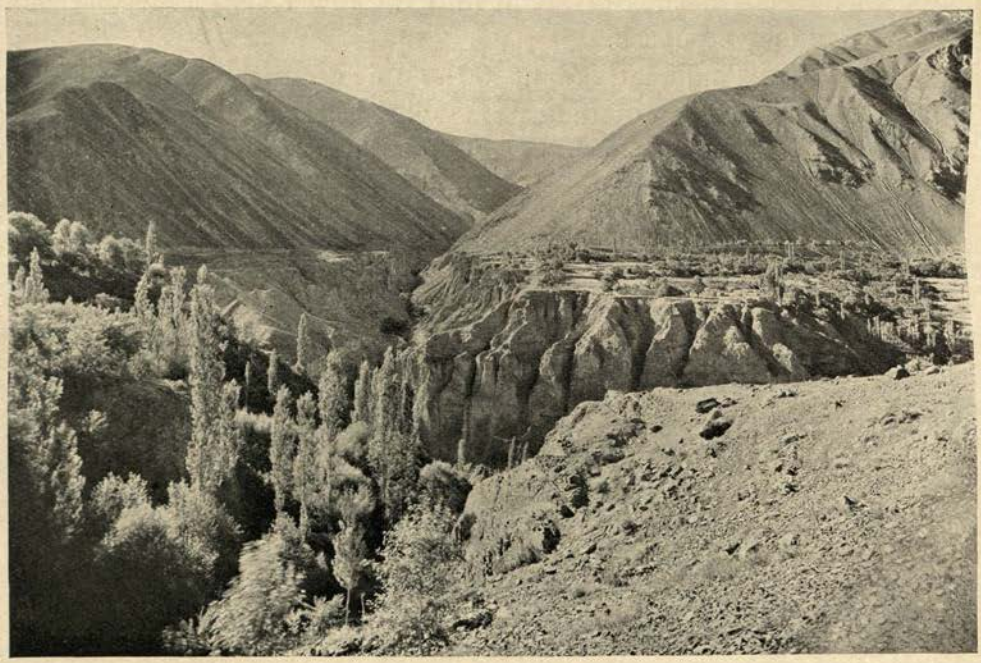
the plains and the first to meet whatever vapour may be drifted against the highlands from the North or West. Where earth had been turned up by the plough we saw many birds hunting for seeds and insects. At 6000 feet snow began to appear and the path crossed several very steep gullies which demanded care in case of a slip. It was a great joy to be among alpine surroundings again, to step on white nevé and to hear the waters rushing. The pass was won at 10.45, but we had dawdled a good deal on the way. We were now standing in a hollow running parallel to the main ridge and separated from the plains by

77. The Zarafshan Valley near Sasun; looking down stream.



78. The Darkh Gorge.

in detail. In parts the slopes are coloured with outcrops of red, yellow, brown and white marls. The higher flanks show blackish rocks, where gaunt gorges with mysterious depths caught the splendour of the setting sun and were bathed in purple fading into mauve. Near the top we could see a sprinkling of gnarled trees which, where they came into the sky line, made the ridge look frayed. On the other side two limestone crags shone white in the last light of day, while above them was a murky battlement of cloud, bluish-grey and lined with pink,

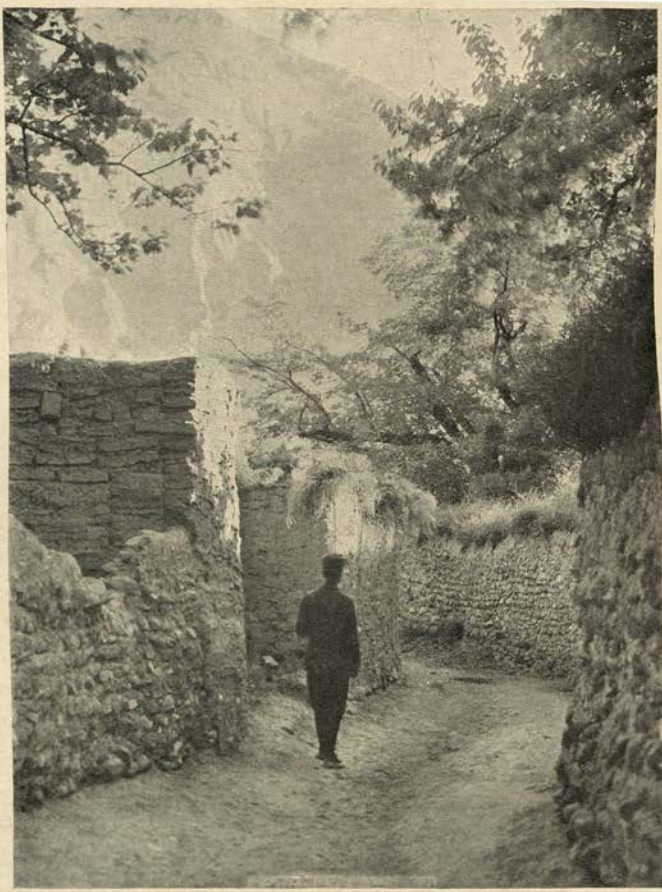


79. A Terrace Oasis.

which cut off the crowning portion of a mighty snow peak. Among the hushed groves, where the gloaming began to filter up from below, one solitary figure in a white robe performed his evening prayer bending and kneeling towards Mecca.

Between Rakhmetabad and Urmitan many of the right and a few of the left affluents of the Zarafshan are intermittent, ceasing to furnish water in summer and autumn. This condition is, of course, due to the fact that these streams come from low ridges without permanent snow or incapable of storing water like the granites of Kemkutan. Besides

of the Yakhsu conglomerates one can see that they are fairly soft. We climbed up to this grey wall which on its base of rounded slopes looks like a fortress on a hill. The ground was hard and hot; here and there some dry grasses and herbs struggled for an existence furthermore endangered by flocks of goats. Besides thyme, sage, and worm-



80. A Lane in Rars.

wood we saw a creeping plant resembling a coarse and stoutly built mimosa and which at this time managed to produce large, white flowers. From above we surveyed a characteristic hill steppe which in spite of its barrenness gloried in a fine effect of artistic distemper. The whole was painted in subdued tints of reddish brown, chocolate and sepia, with bold streaks of orange and delicate shades of grey thrown in

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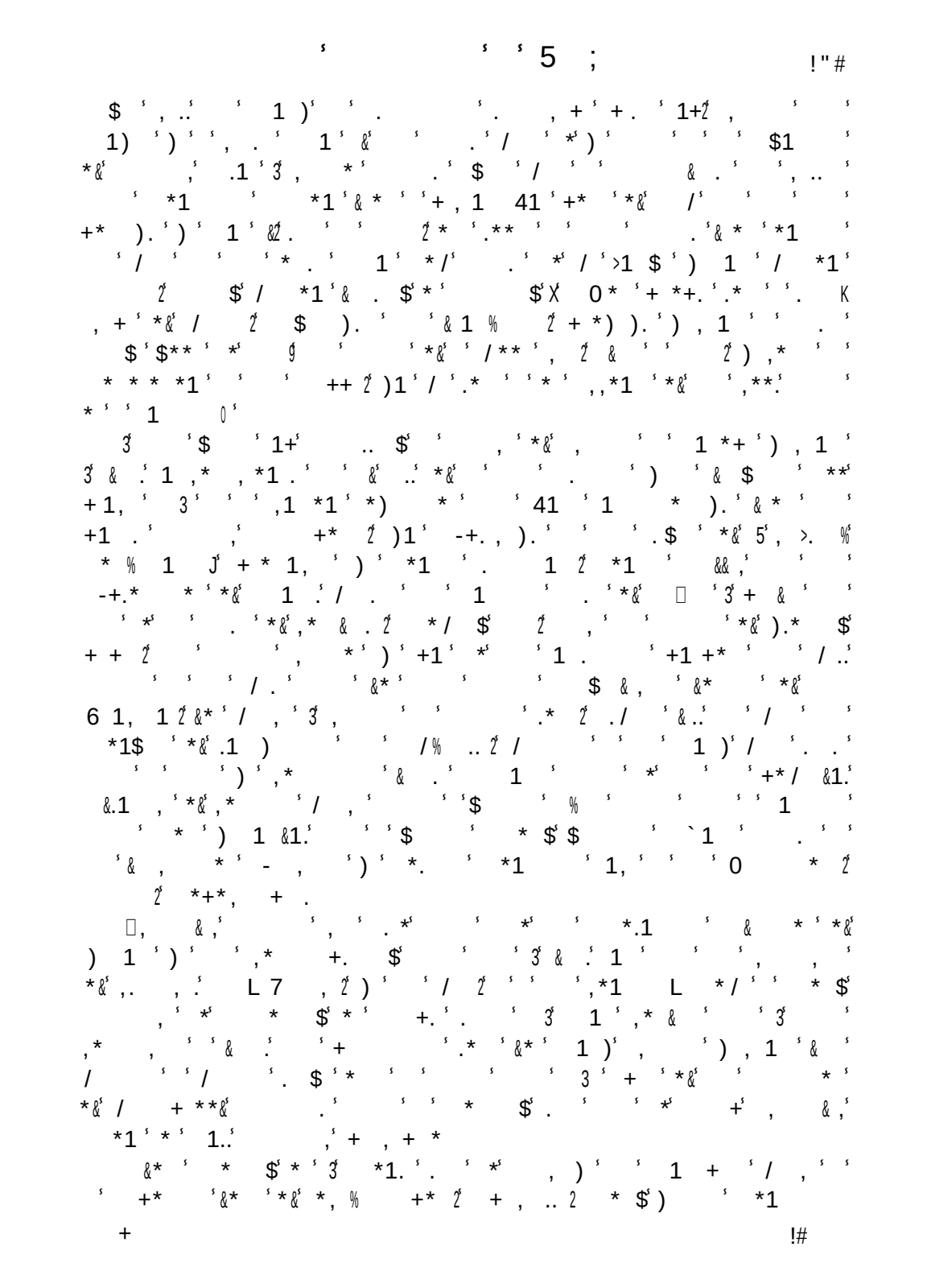
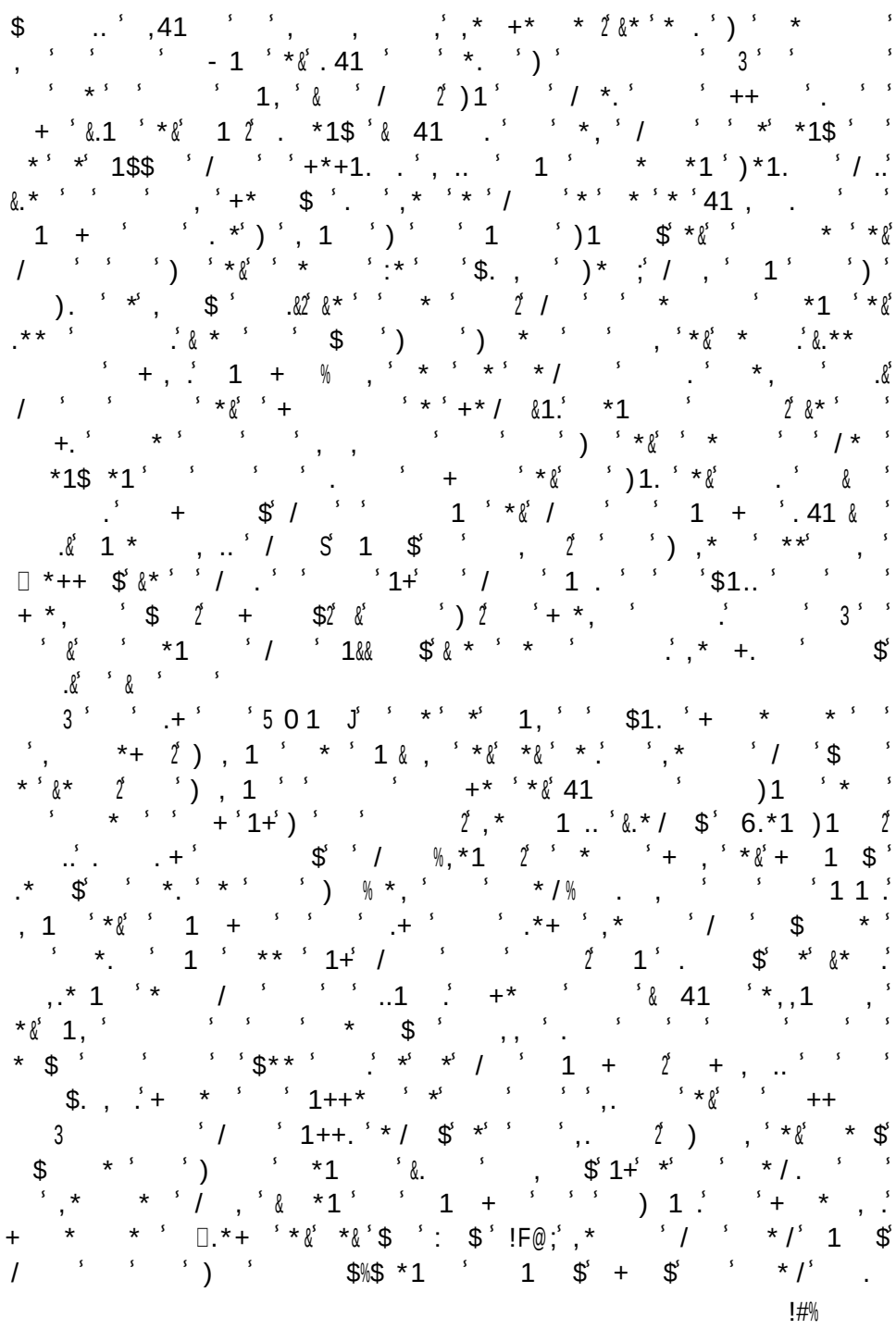
shapes are forced into strict repetitions under the ban of a general and uniform pressure, which crushes all independence out of the waves of the dunes and ice-packs. And, finally, we have the ocean and the atmosphere, where there is one huge mass and where only movement is form.

The Duab represents one of the many modes in which water and air combine with each other and with the soil; it is one of the stages of imperfect interpenetration. The less thoroughly elements

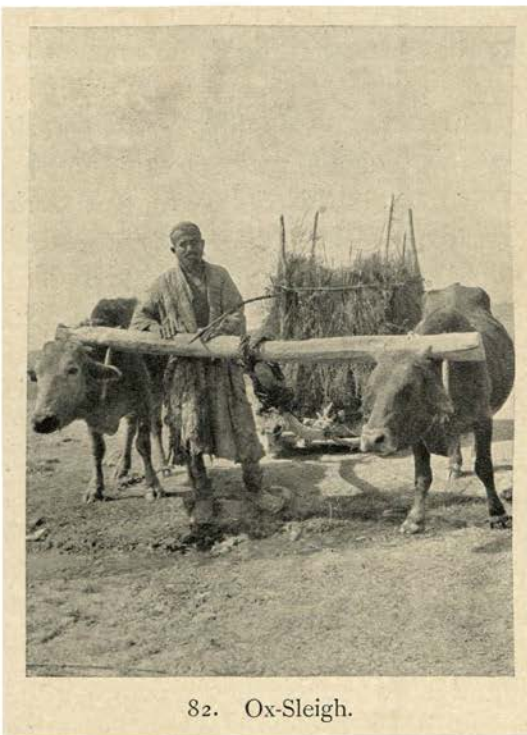
81. A Double Bridge over the Zarafshan.

are mixed the more each of them preserves its own texture or colour, the cruder is the contrast between component parts. In an oceanic climate this intermingling of atmospheric circulations and their close contact with the earth's surface attain the highest degree; the elements are shaded off into each other. Of this condition the forest is a leading symbol, being result as well as agent of an energetic interpenetration between the kingdom of the clouds and the realms of stone. If so willed and if we only identify perfect blending with the master-hand, we





evenly over a large surface thus soaking a top layer of the friable stuff up to bursting point. In this manner large quantities of half liquid rubbish are suddenly set free, initiating the process. Conway has given a very good description of mud avalanches in Nagar and Hunza (*Geogr. Journal*, 1907, pp. 501–2), where they occur on a far grander scale than anywhere in the world and with the regularity of clockwork, forming a typical period of the mountains' seasonal life. Conway saw as many as 150 falling over a single broad hillside during one day. On the top of this flank, 10,000 feet high, were slopes cloaked with rapidly melting snow, the water trickling down innumerable little rills which gradually united into large and steep gullies at the bottom. Mudspates were continually being discharged and re-formed, and in one trench five were counted in an hour. This happened late in June and early in July, a time which coincides with my observations in the Duab, for when I passed through the Zarafshan valley the activity of the mud-shoots had already ceased, most of the winter snow having disappeared. Thus I only saw the fresh deposits, unmistakable by their shape and texture.

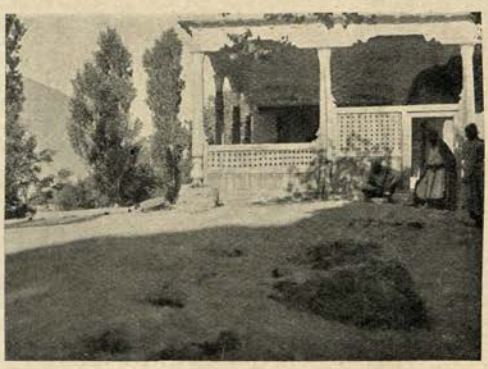


82. Ox-Sleigh.

When not too liquid the discharge forms a snout or tongue such as seen in Fig. 84, where an overflow from the gully has been thrown over the brim. This is the lobate shape assumed by all viscous matter such as snow-avalanches, glaciers, lava, honey, peat-bog, and the like. But this only happens when the mixture is fairly thick and allowed to rest on gentle inclines. The other extreme is represented by narrow gorges ending in a river which prevents accumulation. Usually the mudspates build up an irregular cone or delta (Figs. 86, 167) furrowed

most important agent in forming the miscellaneous deposits you meet with in the valleys. The moraines, even though enormous, are secondary, and are not so big as the enormous deposits produced by the mud-avalanches...and the volume of débris that they must have brought down in the fortnight was enormous, far greater in proportion than anything carried by the glacier in a similar length of time."

Secondly we must remember that the stones of the mudspate will scratch each other, as well as the rock slabs over which they happen to glide, so that the track could easily be mistaken for that of a glacier and the deposit for a moraine. This is not likely in a broad valley, but a clayey bank richly garnished with blocks and suspended at the end of a steep ravine may often pass, and perhaps, for all we know, has sometimes passed, for boulder clay from a hanging glacier. To this must be added the hypothesis of modern glaciology which assumes a very dry climate during interglacial periods, not only comparatively, but according to present conditions, namely, those reigning in the steppes and deserts of to-day.



83. A Village Mosque.

On the whole I am inclined to believe that the high mountains of the Duab are very much like what the Alps must have looked after a maximum, when the ice streams were in retreat. What with screes, mud breccias, alluvial fans, conglomerates, terraces, cones, loess banks, loess mixed with stones, moraines, wind-drifts and residual soil the Zarafshan valley presents material of endless abundance and bewildering variety to the student of post-tertiary deposits. I can strongly recommend this morphological museum for the investigation of all the possible forms of rock-waste disposal.

Up to Urmitan, which we reached on the second day out from Panjikent, we crossed the river several times by frail bridges. At first we followed the left bank as far as Yabon, where a tributary throws out a large fan forcing the Zarafshan to describe a loop. This cone

delta owed its origin chiefly to successive mudspates, the superimposed layers of which could be easily distinguished and which were traversed by a rift from 16 to 20 feet deep with loamy walls. At the mouth of a smaller gulch we found the most perfect specimen of a mudspate snout I have ever seen. It had the shape of an avalanche tongue, having come down as one mass of thick clay of an ochre colour, probably owing to a liberal admixture of loess. Like the snow of some avalanches this mud, which must have been very sticky, had rolled itself out into numberless balls and nodules, now caked together and as hard as stone.

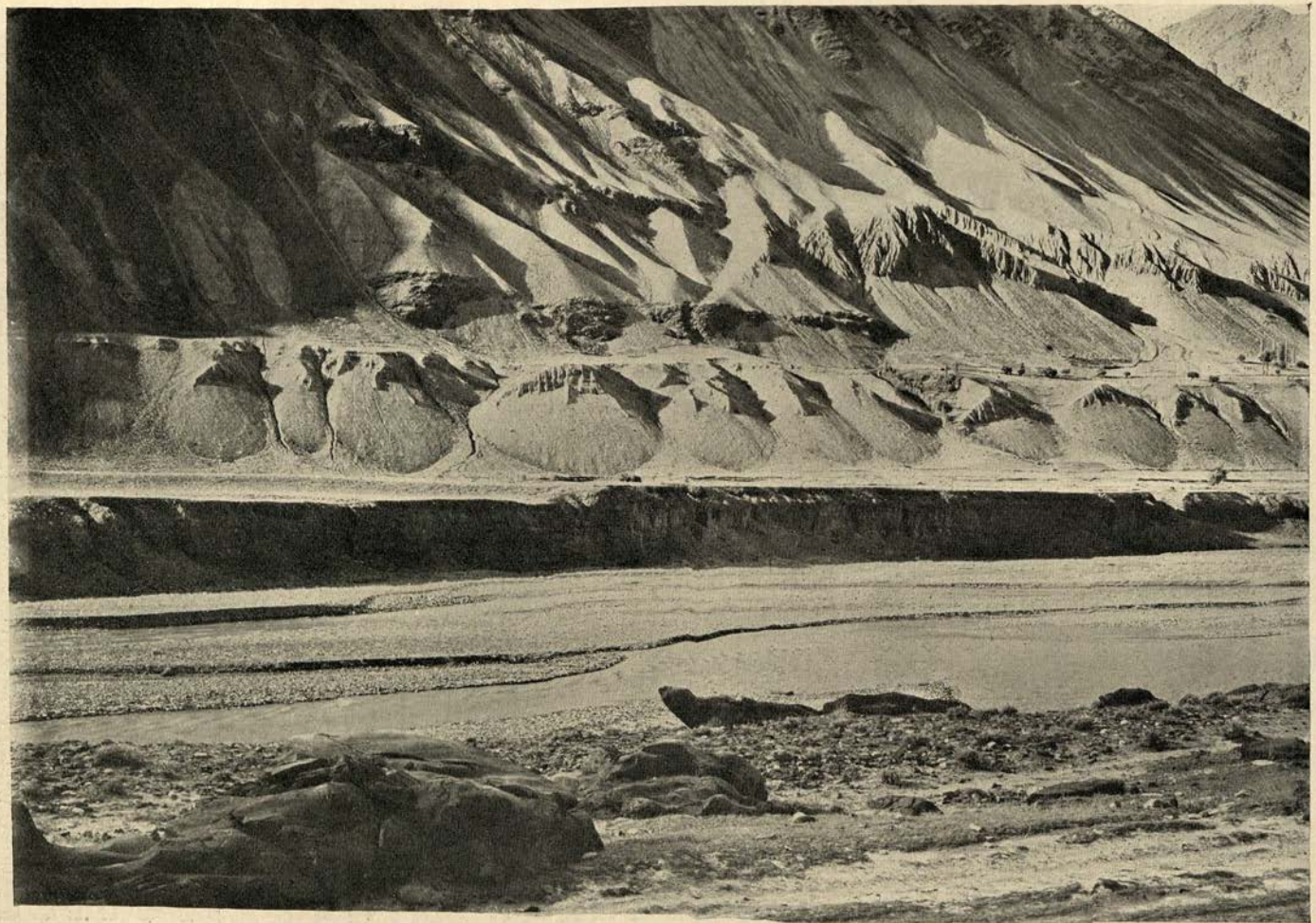
84. Mudspate-track opposite Veshab in the Zarafshan Valley.

The sides of the little valley, whence this disgorgement had belched forth, were splashed with dried mud as if a Sart house-builder had flung loess mortar against the rocks with his trowel. Here also was a deep channel with vertical sides and at the bottom there ran a miserable thread of warm water.

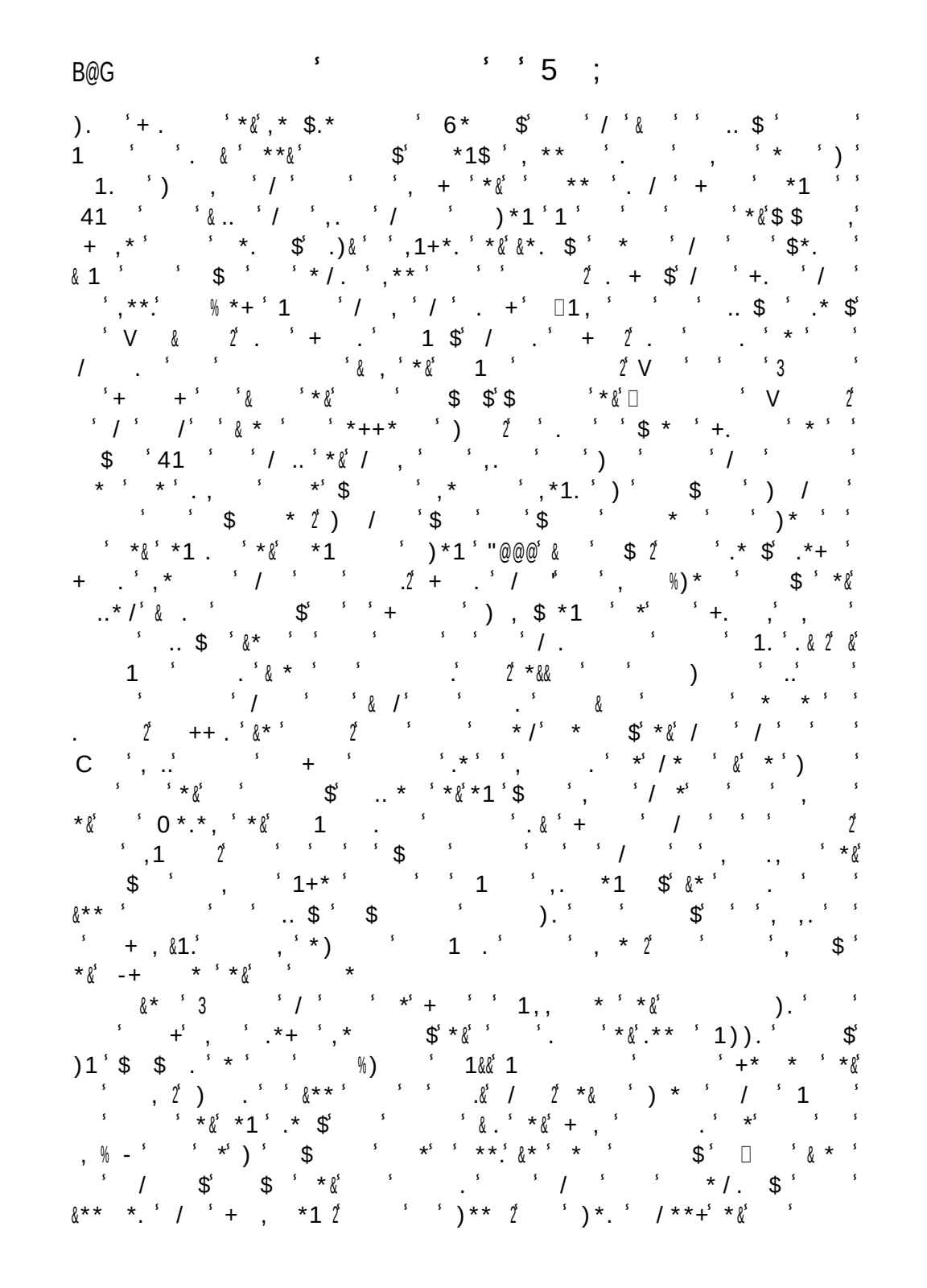
As the Hissar and Turkestan ranges come very close together here, not leaving room for terraces, the mountains slope straight into the Zarafshan. Some of the inclines are covered with a gritty soil baked so hard by the sun that the path is merely sketched out, and

85. A Study in Relief. Welted Furrows and Lions' Paws in the Zarafshan Valley.

86. Alluvial Cone with Furrows.



87. Talus Cones.



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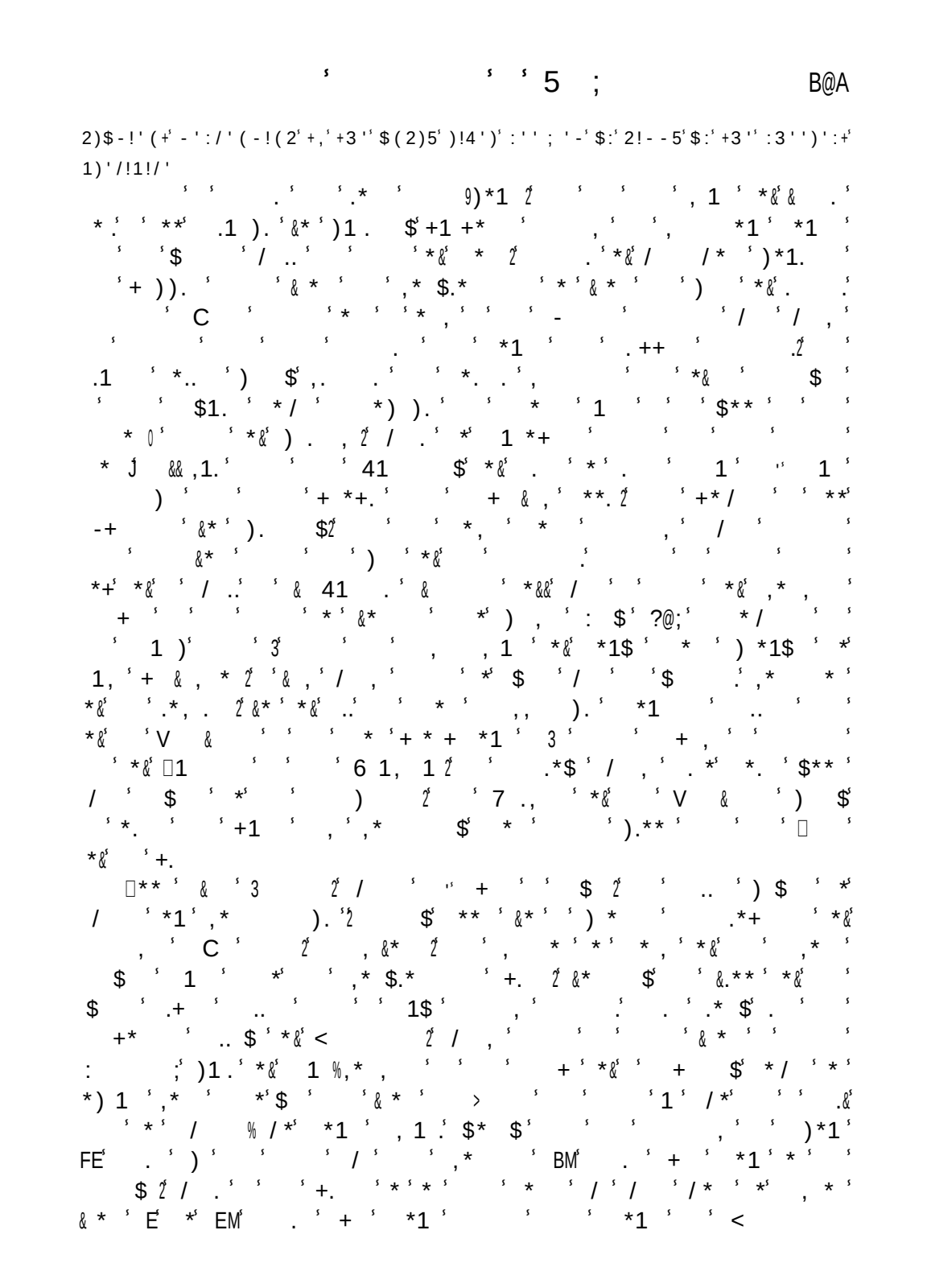

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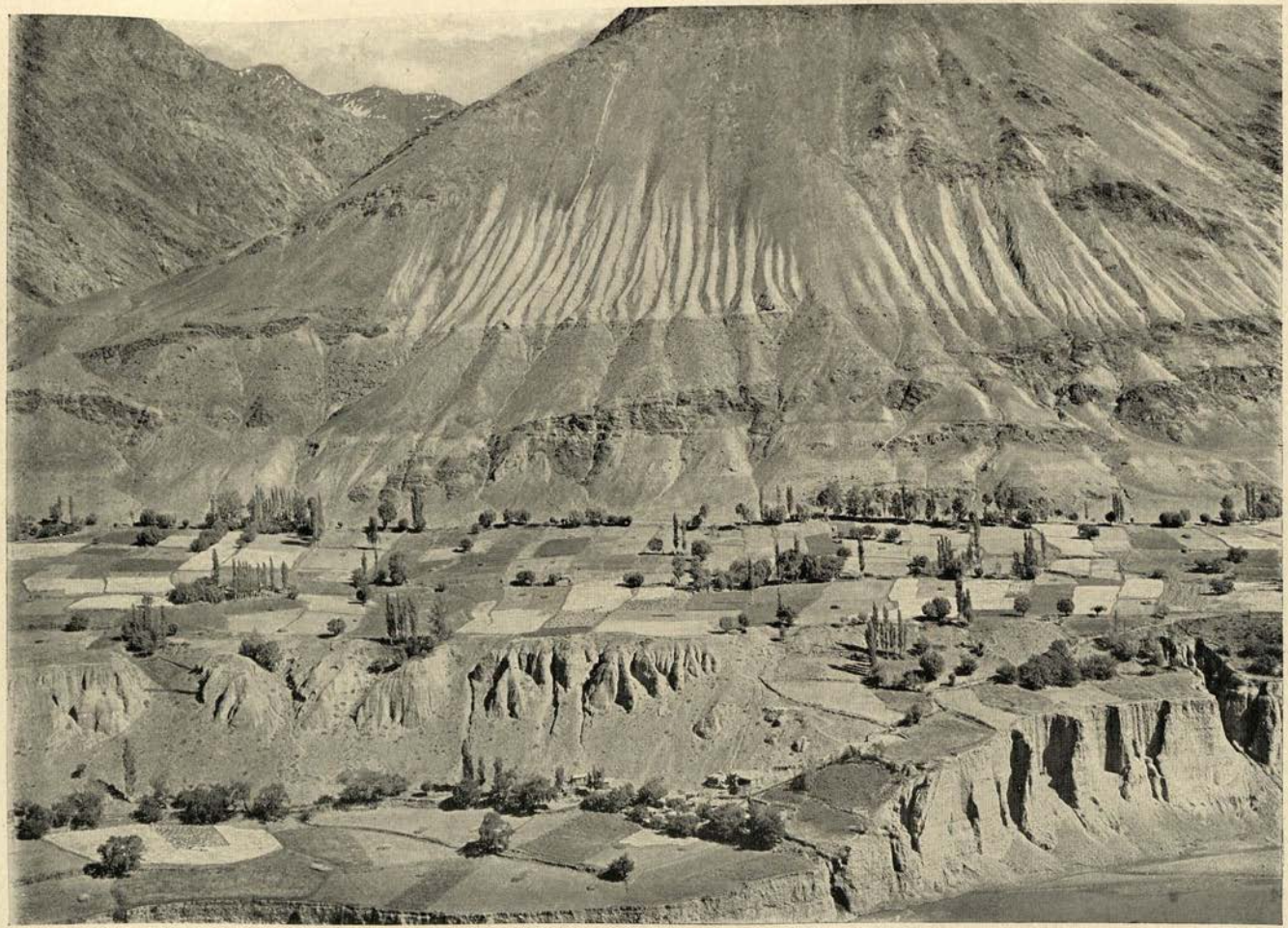
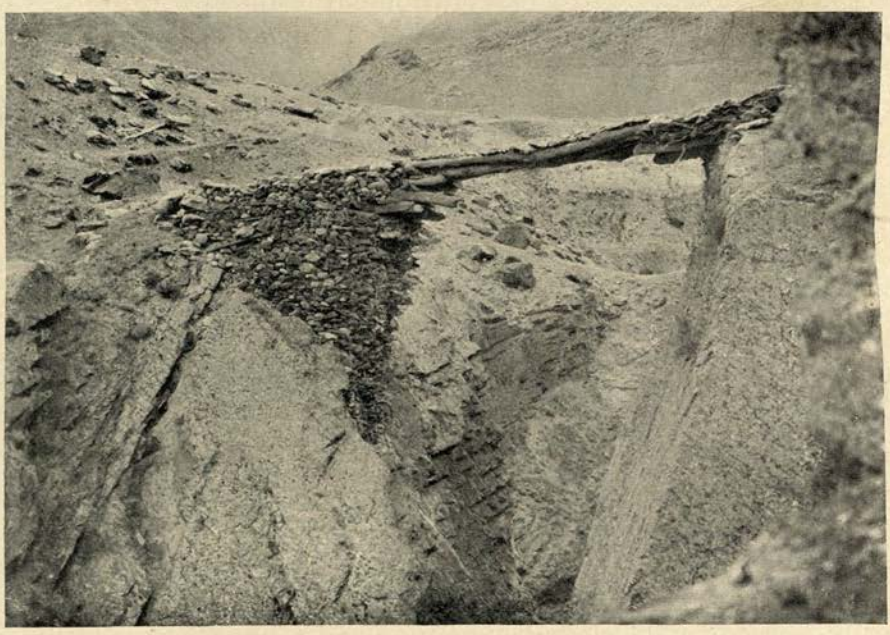


88. Man and the Mountain; Dangari on the Zarafshan.

cannot be without artistic taste or appreciation, for even supposing that things were thus arranged without much forethought, they have, at least, avoided blunders capable of destroying the unsought effect. The intention of creating something picturesque may be rare, but the faculty of knowing what is pretty or beautiful seems to exist. The natives build and live under the immediate pressure of and in accordance with their natural environment which makes them less liable to err on the side of artificiality. This is, of course, speaking from our point of view



89. A Giddy Bridge.

and there remains the question if strange races have the same fundamental taste as ourselves.

On this point I should like to express a belief that nature forms the impartial basis of aesthetic valuation, if not between all mankind, at least between the cultured individuals of civilized races and all men. Thus we (i.e. the educated and thinking Europeans, Chinese, Japanese, etc.) form the subjective standard of beauty, because only we are able to abstract aesthetic impressions from utilitarian or moral considerations and because among ourselves only are such problems discussed to their uttermost limits. The objective standard then is

90. Fan Delta and Glacier of Sabak.

91. Paldorak; Looking North-east.

The houses of Paldorak are collected in clusters between erratic lanes and the only timber visible is that of the doors. Nor can the rafters supporting the flat roofs of beaten mud be very solid judging from the elastic swing as one walks across. The more ambitious homes boast of clay chimney-pots about a foot high. Here, more than anywhere, the roof serves as a platform for useful duties and the no less useful exercise of laziness. On it all housework is done from the winnowing of corn to the spanking of children; gossips congregate and from this point of vantage women, boys and girls gaze upon the sights of the world. A broad piece of greensward in the middle of the hamlet formed our camping ground and within the shortest possible time after our arrival the spectators had arranged themselves on the tops of their low stone hovels. They crowded and huddled together, intensely curious, a crew of brown humanity, the sombre tint of their rags relieved here and there by a gleam of colour. We constituted a free circus for the mob as well as for the more dignified citizens of Paldorak. Soon they come nearer grouping themselves on the ground outside our charmed circle of trunks and boxes which is to keep them at the distance of the longest flea-jump on record. Thus they sit expectant, young and old, often two deep, forming a crescent the concave centre of which is turned towards the door of our tent as being the focus of interest. Even late at night, looking up from our supper through the faint radiance of the lantern we espy the pale sheen of listening and peering faces, patiently waiting for new impressions, drinking in the glorious tamasha. Only of photography they seemed to be afraid, but one day I hit upon the brilliant idea of executing a war dance in front of the camera to attract the foreground necessary for enlivening the picture. The stratagem was crowned with success and while I made the exposure my wife kept up the spell by a continuation of the performance.

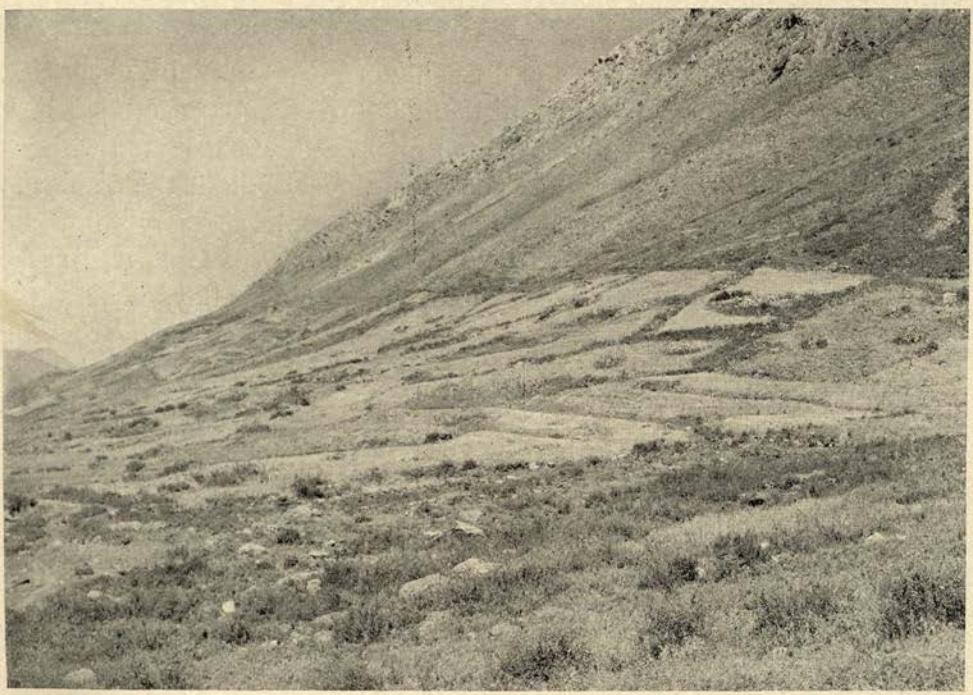
92. The Boys of Paldorak.

Camp life has by now found its groove of well-ordered routine.

93. Alpine Reach of Zarafshan; First Glimpse of the Glacier.

throughout this gamut of dairy produce was a harmonious admixture of hairs and dust.

An ever thickening carpet of plants began to drape the slopes, but always retaining the character of the steppe inasmuch as bare ground can be discovered in between the plants however close, whereas in our climate the interstices are filled up by smaller weeds, grass and moss. Sometimes we broke into a perfect oasis of wild-flowers; purple phlox, wild roses, yellow and white vetches, geranium

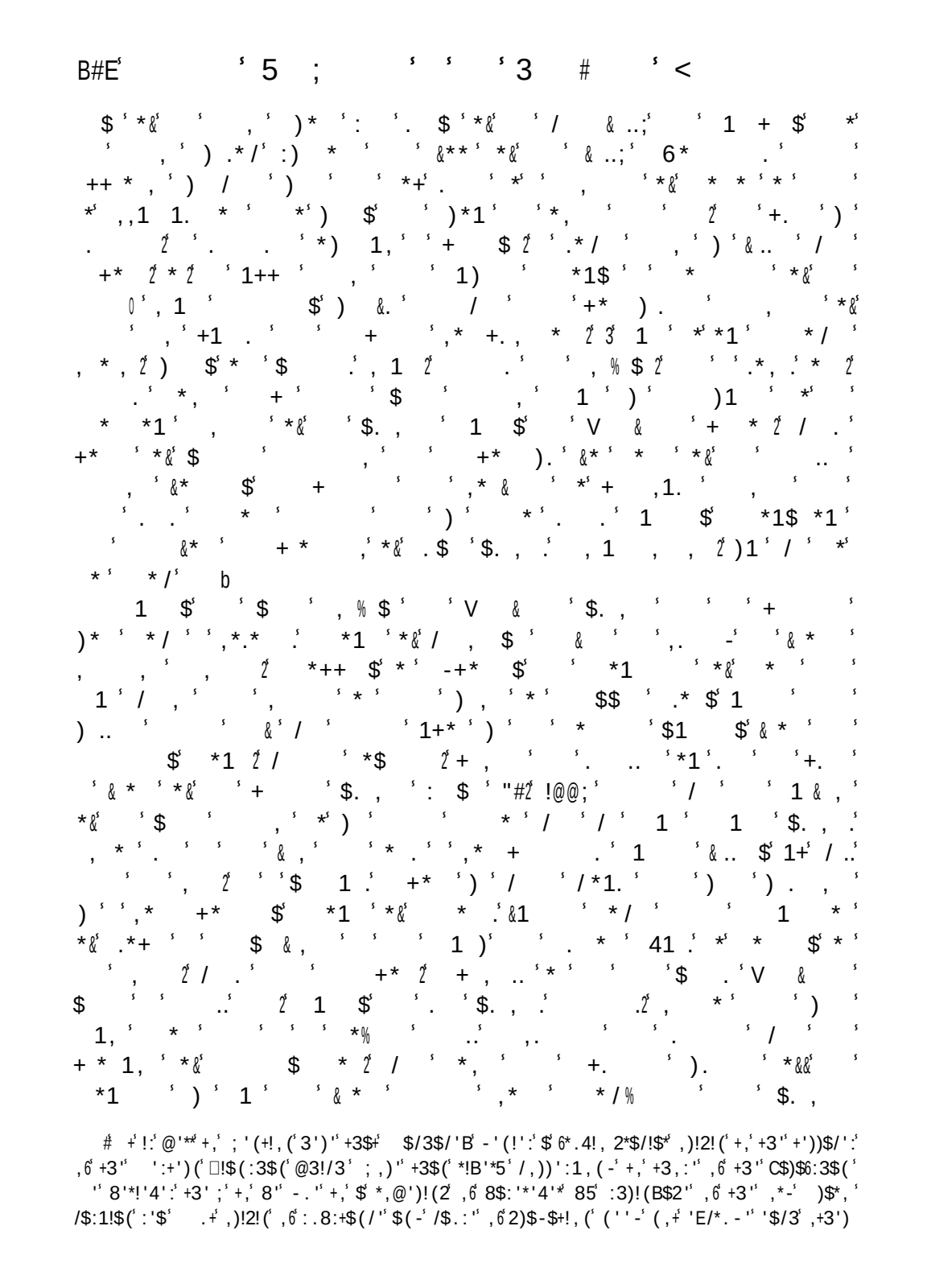


94. The Highest Fields on the Upper Zarafshan.

and other home favourites bordered the path in profusion, while from the mould of moister places sprang the leafy gardens of acanthus.

Opposite the lowest of the summer encampments we found the last bridge over the Zarafshan and also the last fields. These are of the unmistakable type which one may call the high or alpine field of the Duab (Fig. 94) and which occurs at heights between 6000 and 9000 feet. In this instance we find the highest barley at about 8500 feet above the sea, while the highest known has so far been observed at

95. Terraces of the Zarafshan near Rars.



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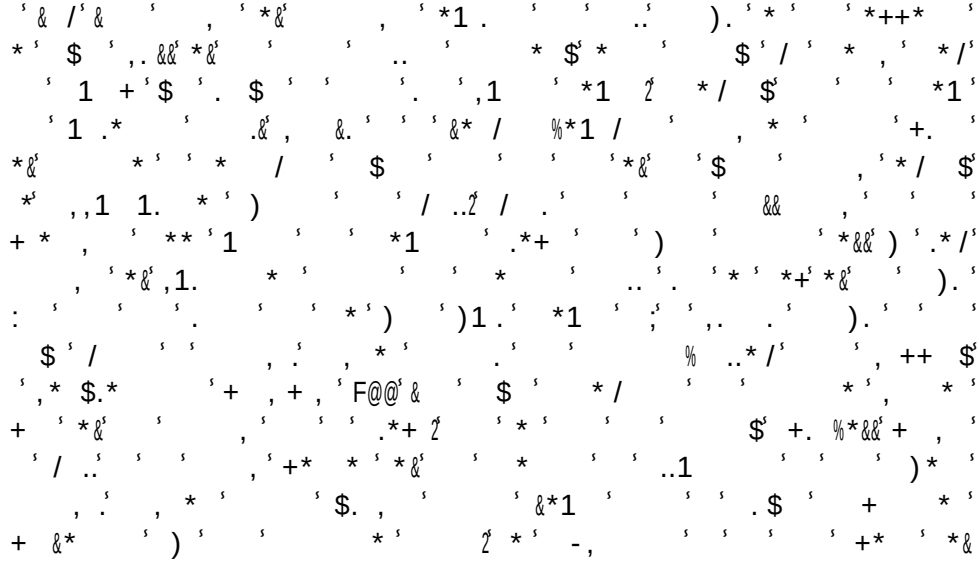

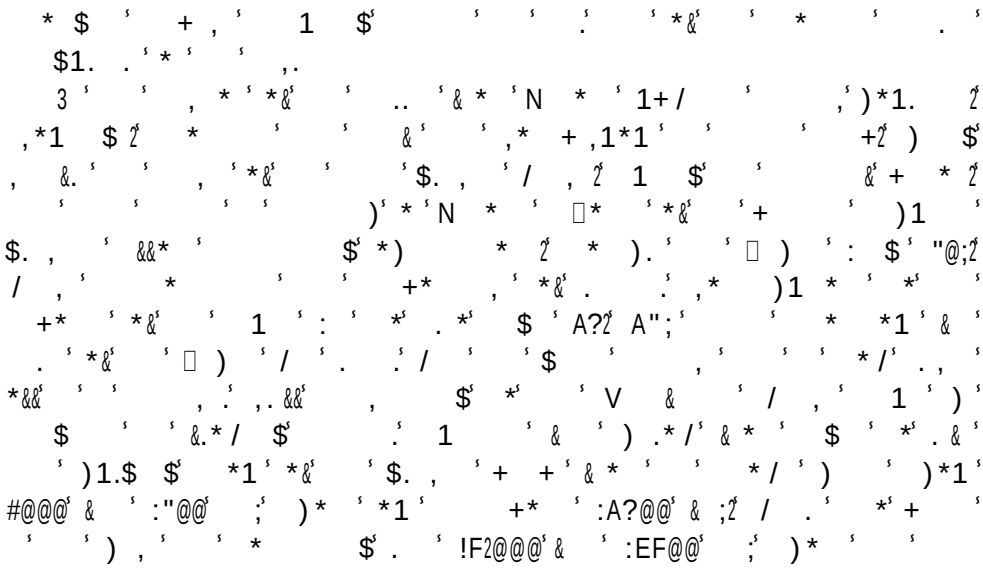

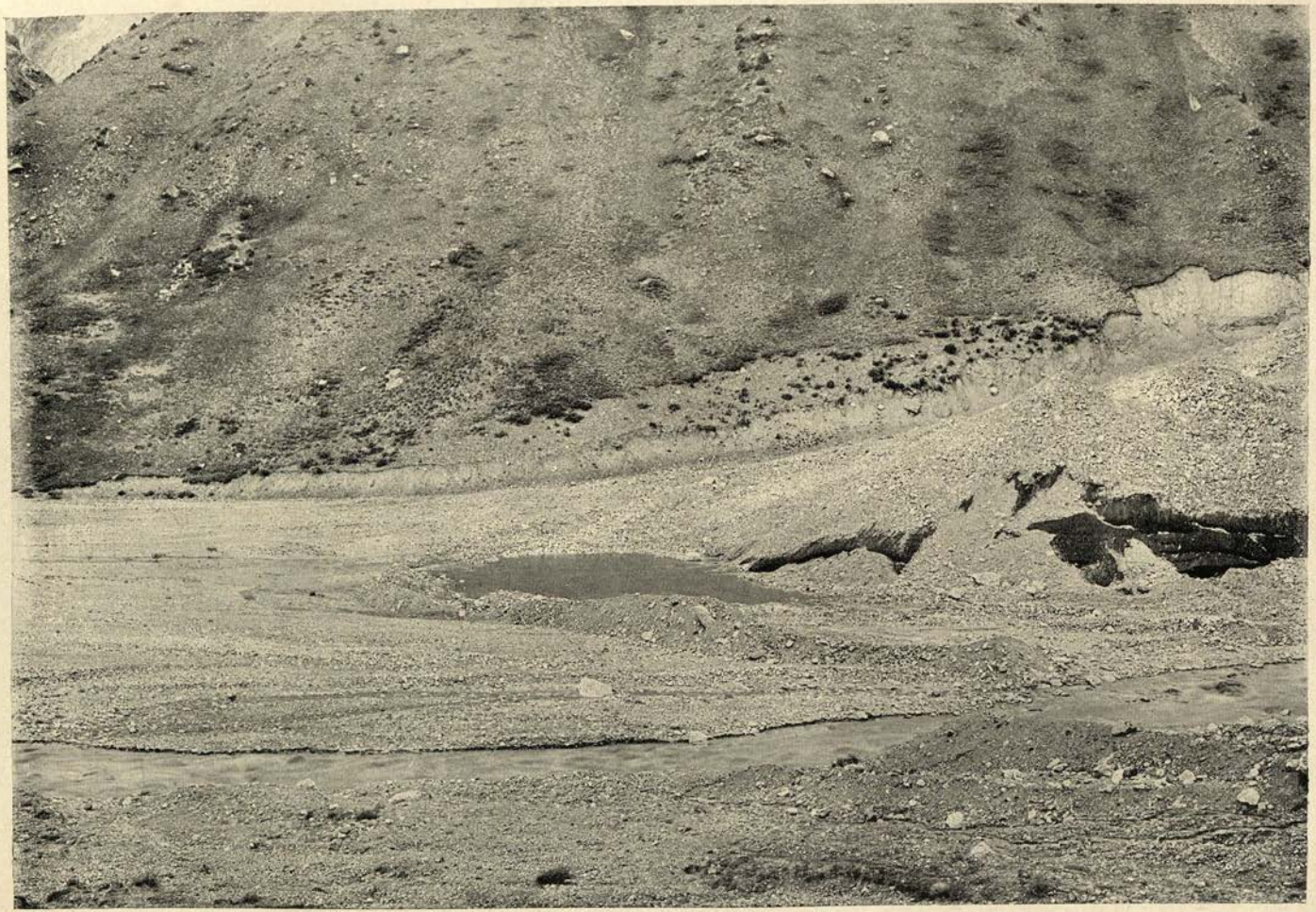

100. End of the Zarafshan Glacier, with Terminal Lake.

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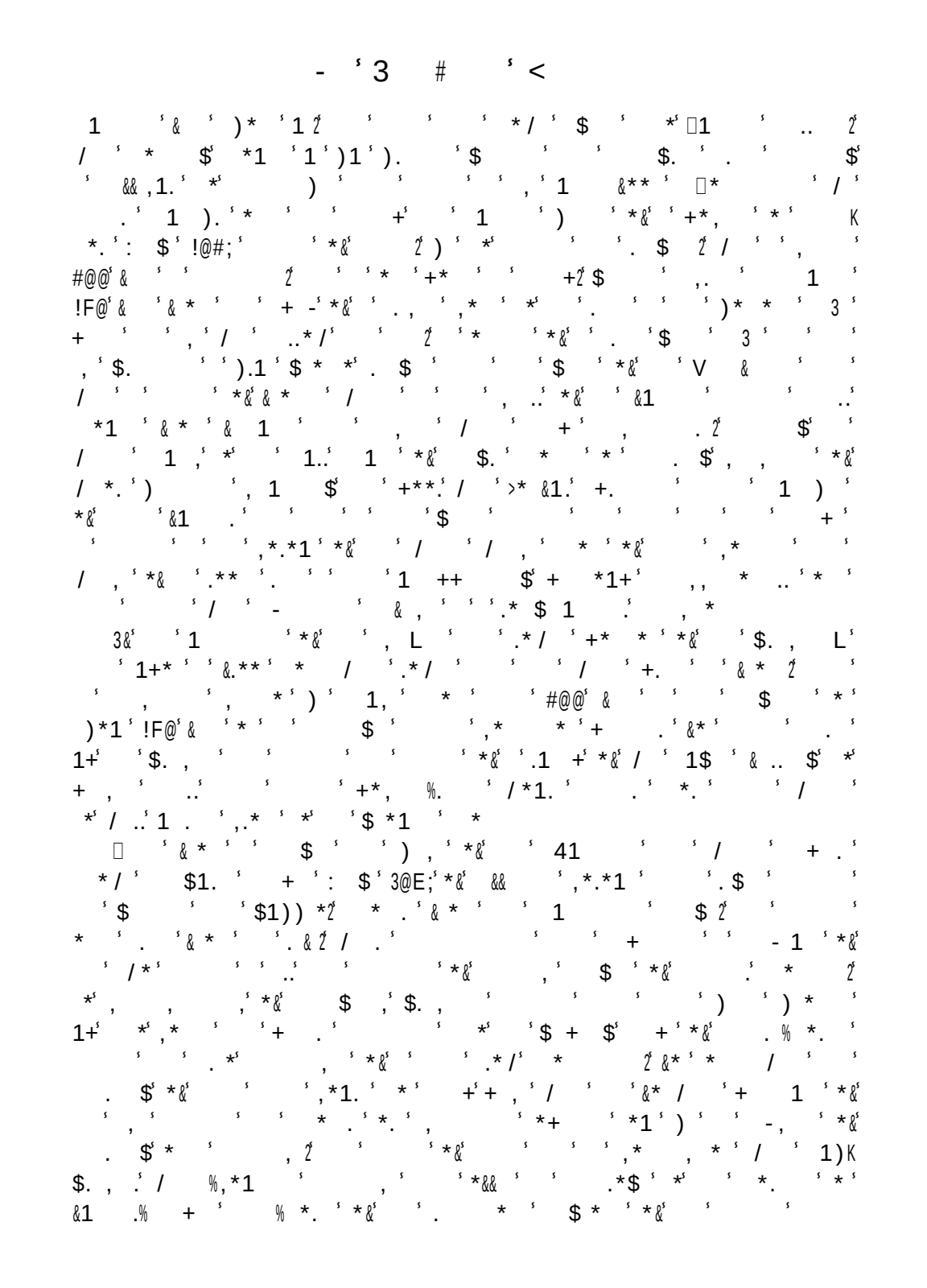
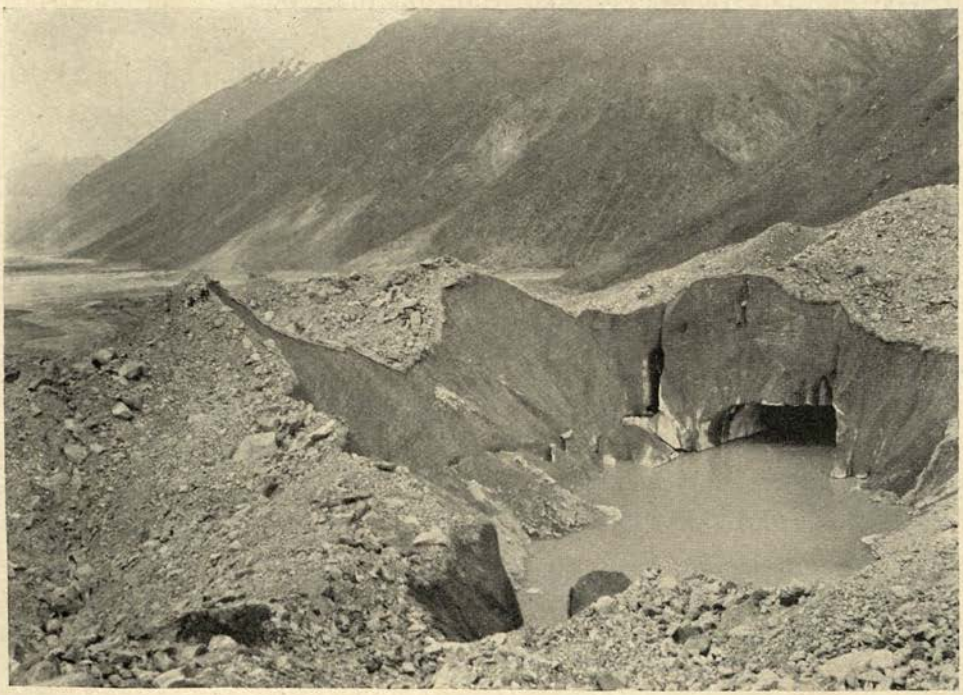
tunnel (Fig. 102) is 40 feet broad and 20 feet high, while the shape of the ice wall suggests that until recently it was a pocket-lake, now broken out. From this vault issues the Zarafshan, a spout of turbid broth, a solution of pulverised mountain. Clambering to the top we find ourselves on the surface of the glacier, if a scene of utter collapse can be called a surface, and cold storage of shivers and smithereens a glacier. One has certainly to recast ones Alpine and Caucasian memories, learning, among other things, of how much variety a defini-

102. Glacier Gate of the Zarafshan.

tion is capable. What from afar seemed a moderate roughness of the sluggish worm resolves itself into the gigantic and glorified reproduction of a desirable building site on lease for 99 years, with the brick heaps of former houses and water-logged pits. We are swallowed up by the heights and depths of a landscape, almost grotesque, contained within the embracing vastness of the mountains. Balancing over loosely piled stones that never settle, we scramble over ramparts of confused blocks, climb to the summit of pointed cones rising fifty or a



enormously increased wasting surface is thus produced and atmospheric disintegration of the ice is accelerated by its dirty and therefore heat-absorbing condition. One cannot expect this honeycombed, not to say rotten, mass to be endowed with any sort of impetus. With a glacier deep-reaching dissection must be as symptomatic of reduced flow (not only increased melting), as the separation into detached pools is with a river. All the same there is a possibility of imagining a continuance of the flow in spite of the cellular structure. One can assume the



103. Pocket Lake on the Zarafshan Glacier.

surfaces of each pocket to be a kind of glacier termination where the new ice is melted at the same rate at which it draws in, threatening to close the hollow. In that case every funnel wanders down the glacier. Still, the fact remains, that movement must be very slight. Obviously the section of the glacier which has numerous and large cavities is "ending all over" by intussuscepted snouts, as one might call them. This cankered and corroded state obtains to about midway between the Farakhnau and Tolstov glaciers, though, of course, a very gradual

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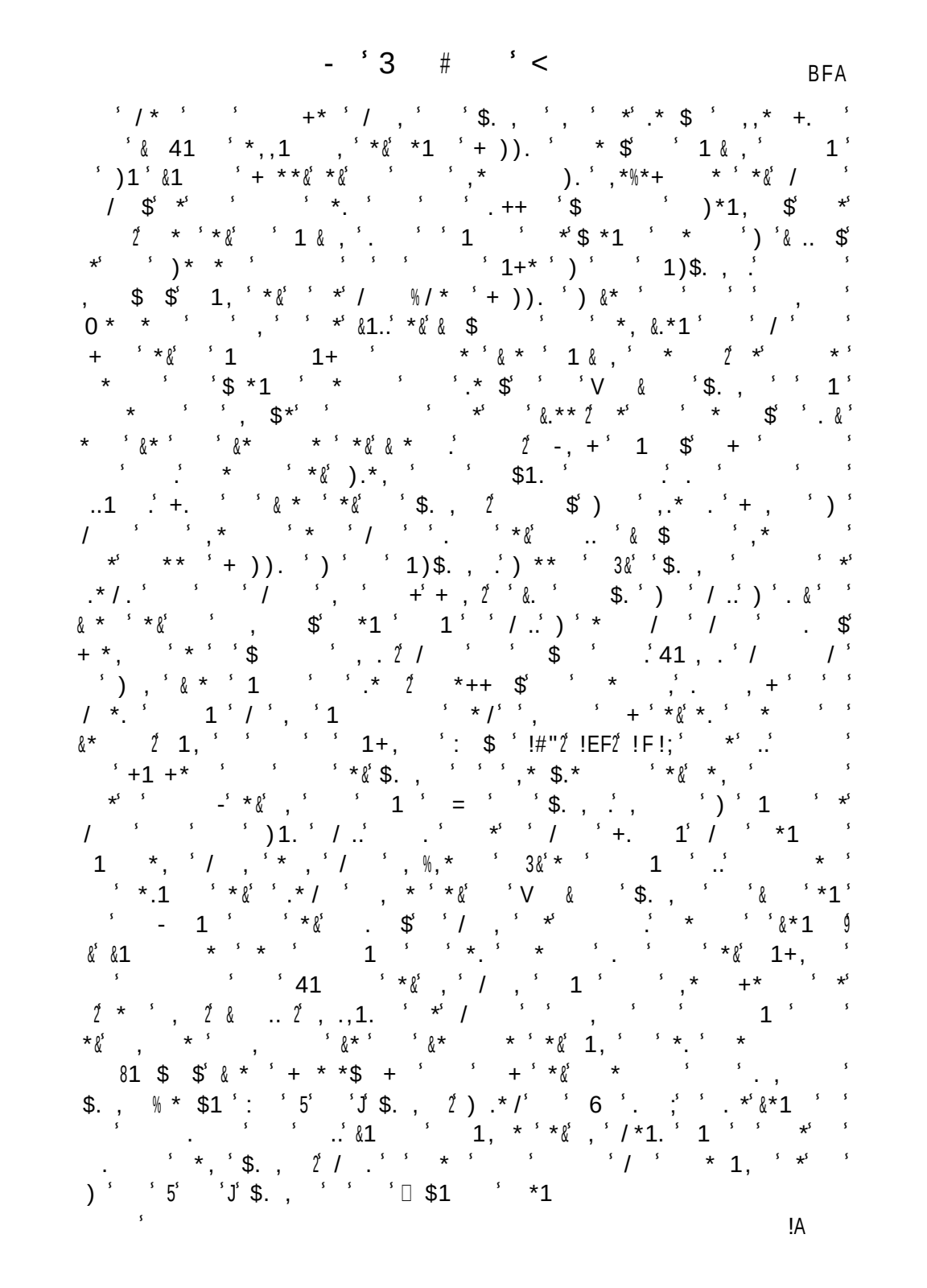

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But the most interesting portion of hanging moraine is preserved further up, especially on the right bank (Figs. 104, 106). Ground rubble and waste-mark are one, forming together an inlaid moraine, a most beautiful piece of glacial marquetry. From a distance this white band is set off in a perfectly straight line from the darker pasture land. A closer view reveals the fact that this dado follows every contour of the slope. Practically flush with the ground it curls round

104. Zarafshan Glacier with Macha Pass in the Distance; View of Right Bank and Farakhnau Junction.

every rib, in and out of every gully, so that all the bulging or grooved features of the slope above find their natural continuations obeyed by the waste-mark below. A mosaic of concrete has been firmly pressed into the flutings of the mountain by the plastic ice. Avalanches may have contributed to a smoothing out of the gullies, for nearly everywhere we found vegetable remains, the flotsam and jetsam of winter, precipitated out of cones of melting snow.

The minor period of glacial growth anterior to the present shrinkage

river. Descending to the alluvial plain we found it well spread, none of its asperities being more than two feet in height. Willow bushes came up quite close to the morainic ring, often dipping their pink roots into the icy current issuing from the breach of the terminal lake. In drier spots tamarisks were thriving. The Rama torrent, which adds quite one-third to the volume of the Zarafshan, flows through a bed somewhat different in character to that of the main valley. There are low, dam-like streaks of cobbles as well as sharp stones. Between

105. Slipping Moraine on Left Bank of Zarafshan Glacier.

them they often comprise dry channels, on the sands of which we followed the tracks of shepherds and their flocks. The whole place was like a stony fallow overgrown with a profusion of blue sage spreading its blaze of colour through a straggling grove of juniper, birch and willow, and exhaling the aromatic perfume of its blossoms.

The glacier has withdrawn about a thousand feet from its last position, but loss of thickness is far more apparent than that of length. The blanched waste-mark, indicating a recent loss of 300

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106. On the Zarafshan Glacier; looking down.

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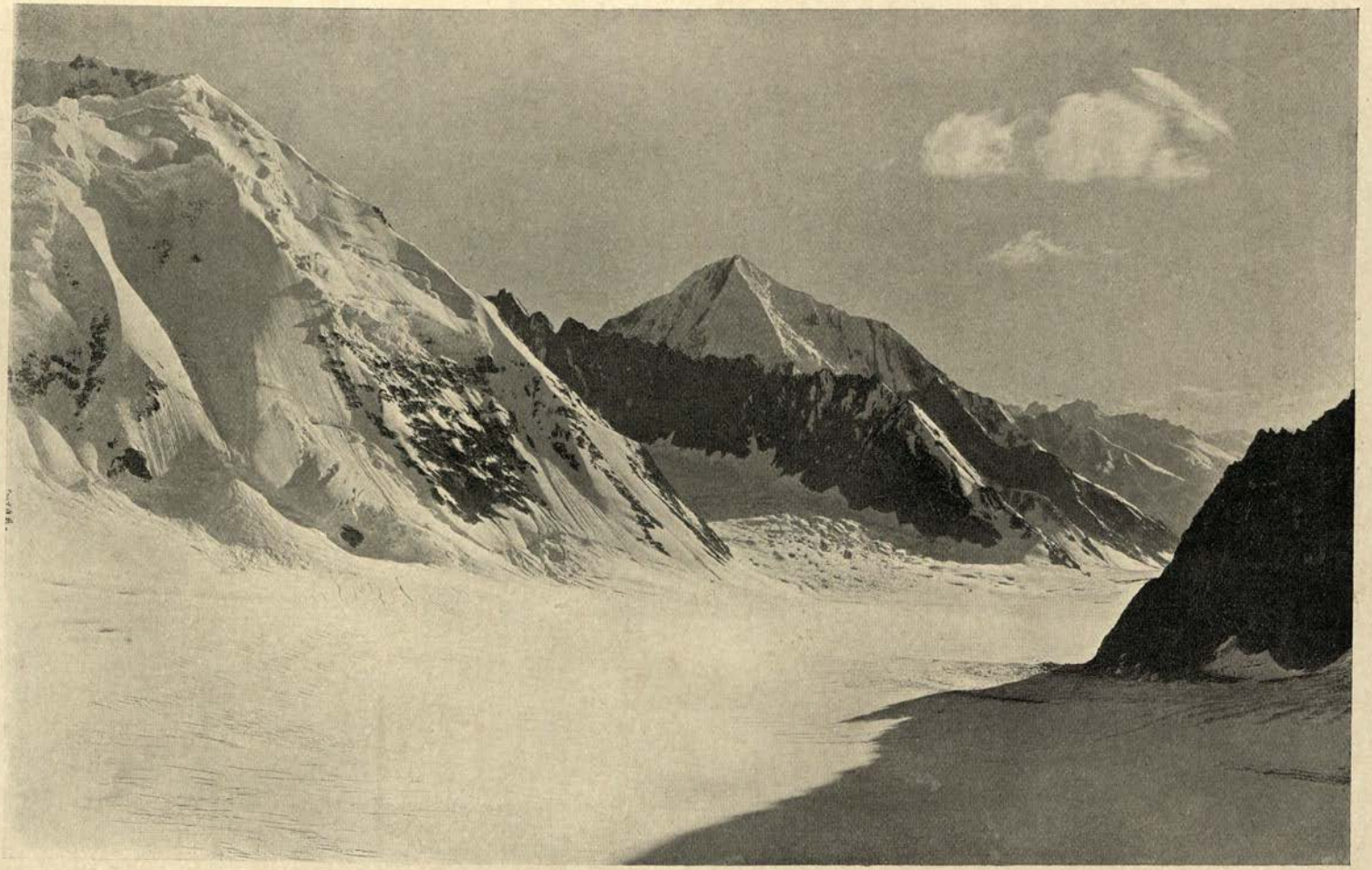
of ice-falls and broken masses of névé on slopes or ridges. The eastern view from the Macha pass is hemmed in by a near circle of great mountains from 16,000 to 18,000 feet high. As they show us their south-western flanks we only see a few small glaciers, while the peaks are merely sprinkled with snow, reminding one of the dry sides of the Pennine Alps.

The names just mentioned were given to the peaks by Mushketov who reached the Macha pass a quarter of a century before us. Although that was a hundred years after the ascent of Montblanc, yet the Russian traveller and his companions were still in the age of Saussure, as far as mountaineering goes. The most difficult pinnacles of Switzerland had already been scaled, the Alpine Club was a hoary institution and the science of climbing laid down in hundreds of printed volumes. But here were the Russians who had never seen a nailed boot, never heard of ice-axes, and did not even know how to walk on a moraine or among crevasses. On the other hand they had equipped themselves with sleighs and dogs as for a Polar expedition, while for moral support they relied upon the proverbial pluck of the Cossacks whose names are immortalised by the Tolstov and Skachkov glaciers. No doubt they did show themselves worthy of their fame, but these horsemen of the plains of the Don are as much at home on a glacier as Albert Lorenz would be on a yacht. Considering that any good walker can cross the Macha pass with a third-rate Chamonix guide, Mushketov's tragic description smacks of the incongruous. This however does not detract from the merits of the undertaking in itself and the honour due to the courage and perseverance of the travellers. They approached the unknown mountain world with grave misgivings and without that experience which would have enabled them to laugh to scorn the bloodcurdling tales of their porters who gave exaggerated

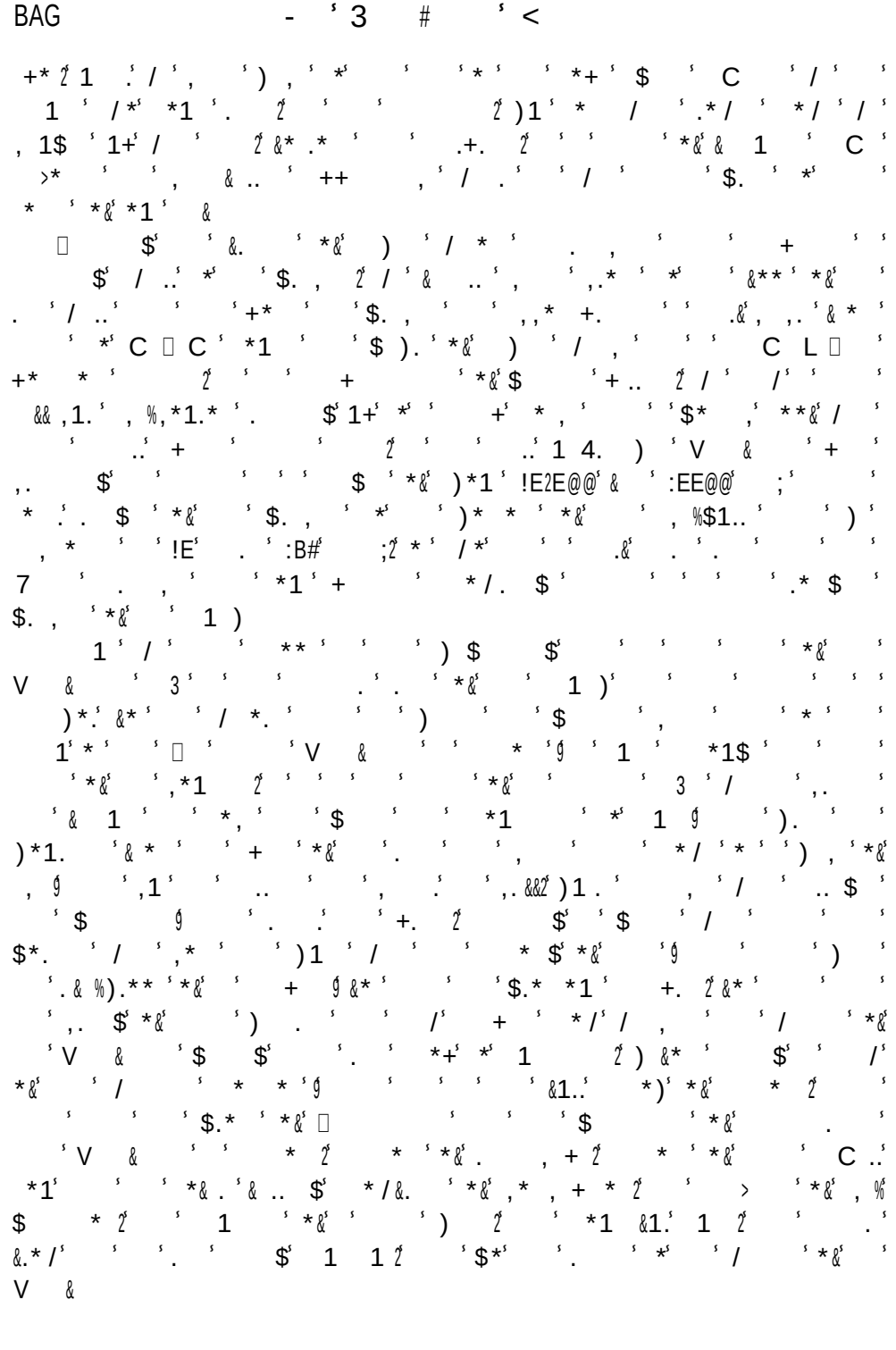
107. Approaching the Macha Pass; Mount Igol on the Right.

108. Mount Igol with the Macha Pass just below it.



109. Mounts Bielaya and Akhun; looking down the Zarafshan Glacier from the Macha Pass.

BAG - 3 # <



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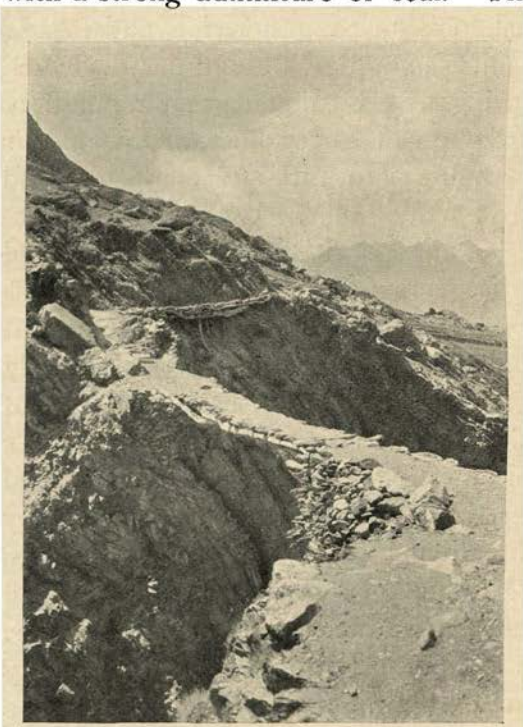
and platforms culminate in the mosque with its pillared portico. As the approach is over the graveyard, the horseman, whose gaze is upon the golden apricots in the foliage above, may find himself upset, if his stallion's foot intrudes upon the inmates who enjoy but scant privacy under yielding vaults.

On the left bank of the river, opposite Piti, are outcrops of slate with a strong admixture of coal. The same coal, in moderate seams, occurs near Kshtut, where a Russian firm is trying exploitation on a large scale.



111. Cornice Path and Bridge.

Also on the left bank, below Piti, there is a smooth rock covered with rude drawings of the ibex (the ahu of the natives) reminding one of the mural paintings of the Bushmen of South Africa. Like the rag-trees, to be mentioned in due course, they are wayside offerings made by the passer-by. In the Duab every remarkable spot on the road is made an occasion for such offerings: the beginning or end of a dangerous passage, the top of a pass, a parting of the ways, the grave of a saint, a freak of nature, waterworn rocks, curious shapes, a cave or other place attracting the eye, impressing the mind, or hallowed by tradition. Or it may be that someone began something at a certain place, that someone did tie a rag to a conspicuous tree, outlined an ibex on the rock, deposited a couple of horns, or buried a relative in holy orders. Hence by force of imitation the first offering may become the cause of repeated offerings in the shape of rags, drawings, and the deposition of anything curious, such as oddly contorted stones, very round pebbles, fossils, or that most typical of all sacrifices, the frontal ornament of horned animals. It is in

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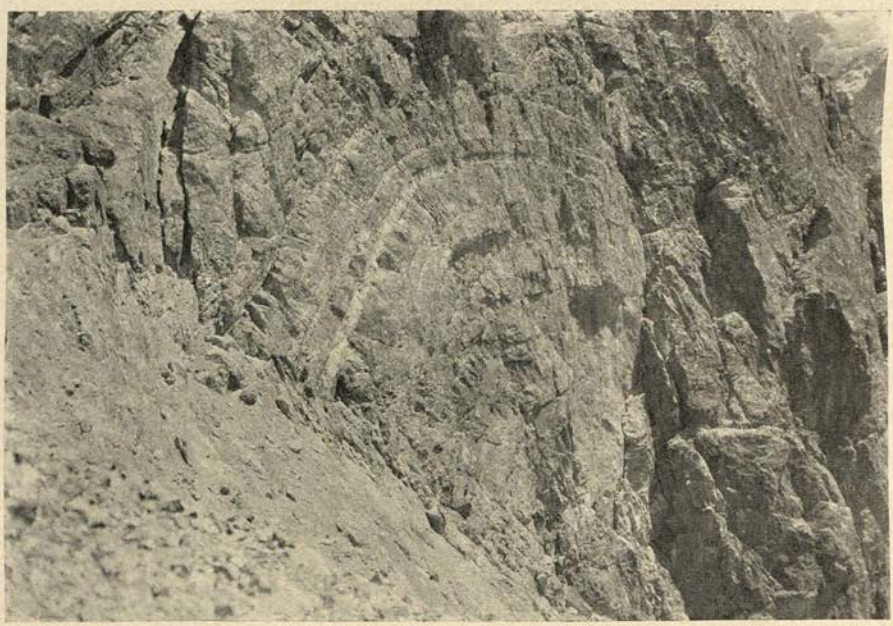
the first shepherds and hunters were attracted by the inviting openness of the Pasrud (named by them after the long familiar stream at the village, for all naming proceeds from below) before they ventured into the darker recesses where the Surkhab glacier lurks in a lair of blackened slabs.

We have now reached, at about 7000 feet, the region of high grazing land laid out on the round-back ridges and spreading slopes which form the pedestal of towering pinnacles or ice-clad pyramids. The view is alpine, but at this time of the year we see greyish-yellow



112. Bent Strata on Khontagh.

tints of dying grass, and hard soil is discovered between the tufts of grass or the single stalks of coarser weeds. Then we realize that the air is dry, that drought has not stopped short on its ascent from the steppes. But if we were to come in spring, we should find a beautiful emerald lawn thriving under many showers and the water from the melting snow which soaks the ground. And the conclusion is that this region owes the preservation of an alpine aspect (in summer and autumn) to its cool height, enabling the truly alpine conditions of spring to preserve their main features, to save their face, so to speak.

north, is barely specked with snow. The opening which frames it has a bold, earthy cliff of boulder clay on one side and a softly puckered, tree-studded pasture hill on the other. When we thus saw the view great clouds were caressing the sky, causing it to shed a gentle light and to blend its eager glare into a deep perspective.

For a long way the Pasrud now meanders peacefully. Its banks

113. A Dead Juniper Tree.

are skilfully rounded off by a natural process, the river having washed out gravel from under the grass, causing the unbroken thickness of the turf to hang into the water with a graceful bend. Presently we branch off from the Pasrud for a while, and climb the Laudan valley by a good path leading through fine groves of ancient juniper, gnarled, twisted and weather-beaten (juniper in Figs. 113, 114, 116, 118, etc.). Two

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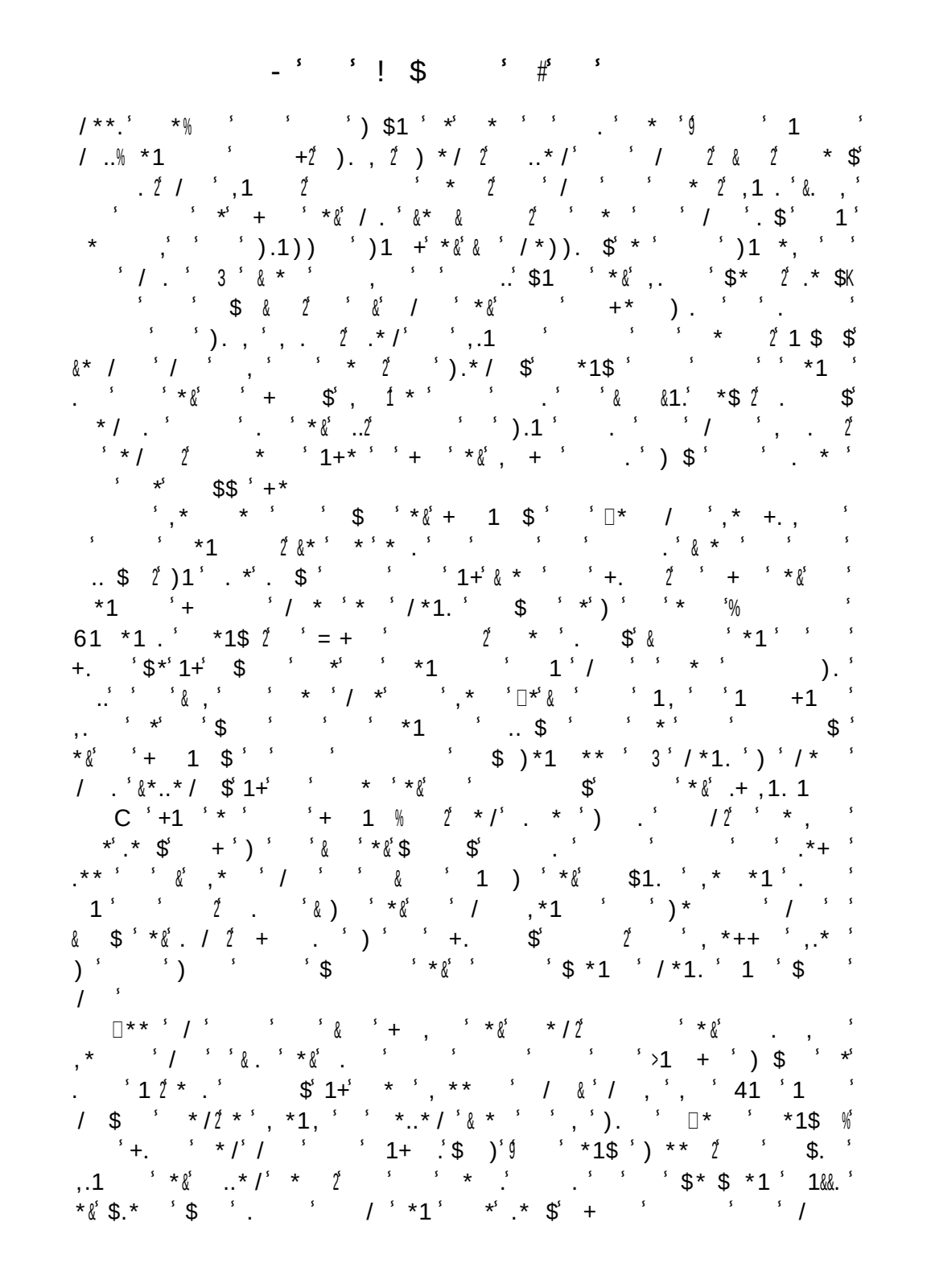

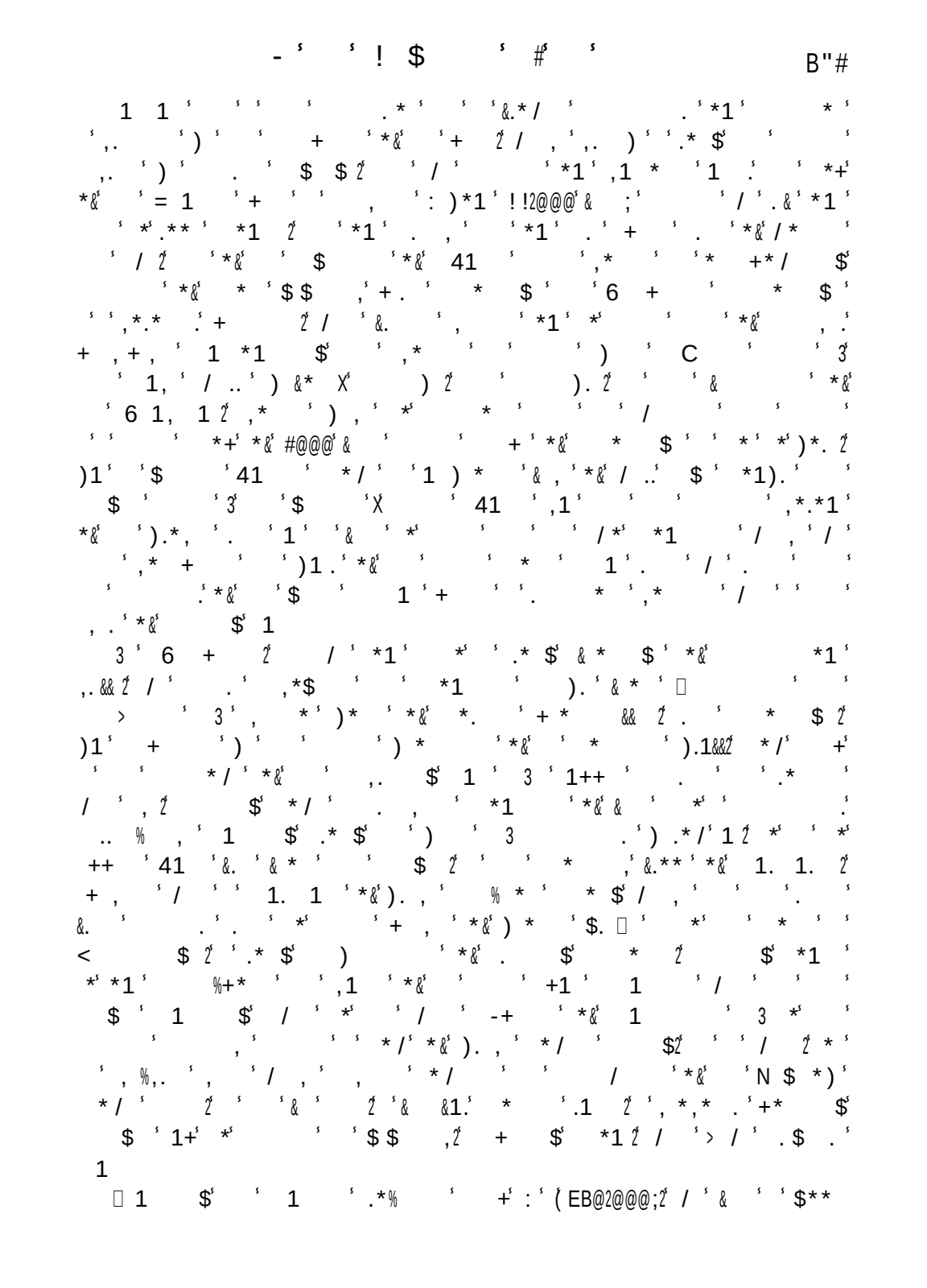

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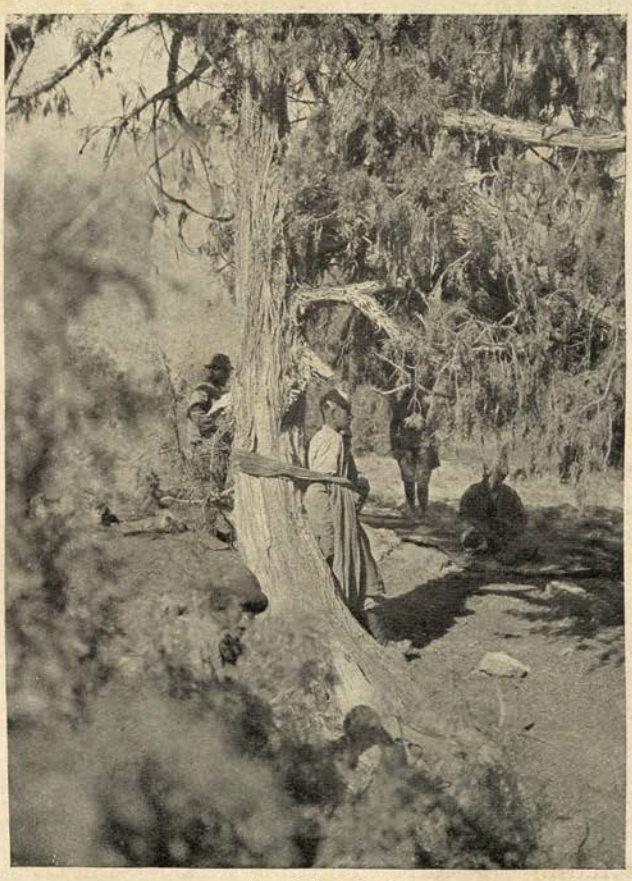
Short as it was, it gave me time to pause and think, and thus it may have saved our lives. In order to sound the intentions of our interlocutors I raised my hand and lifted a stone. Immediately they swung their long and heavy staves and made ready for action, also with stones. Knowing that since David's time shepherds are good shots, I opened negociations, for against two men with clubs and three

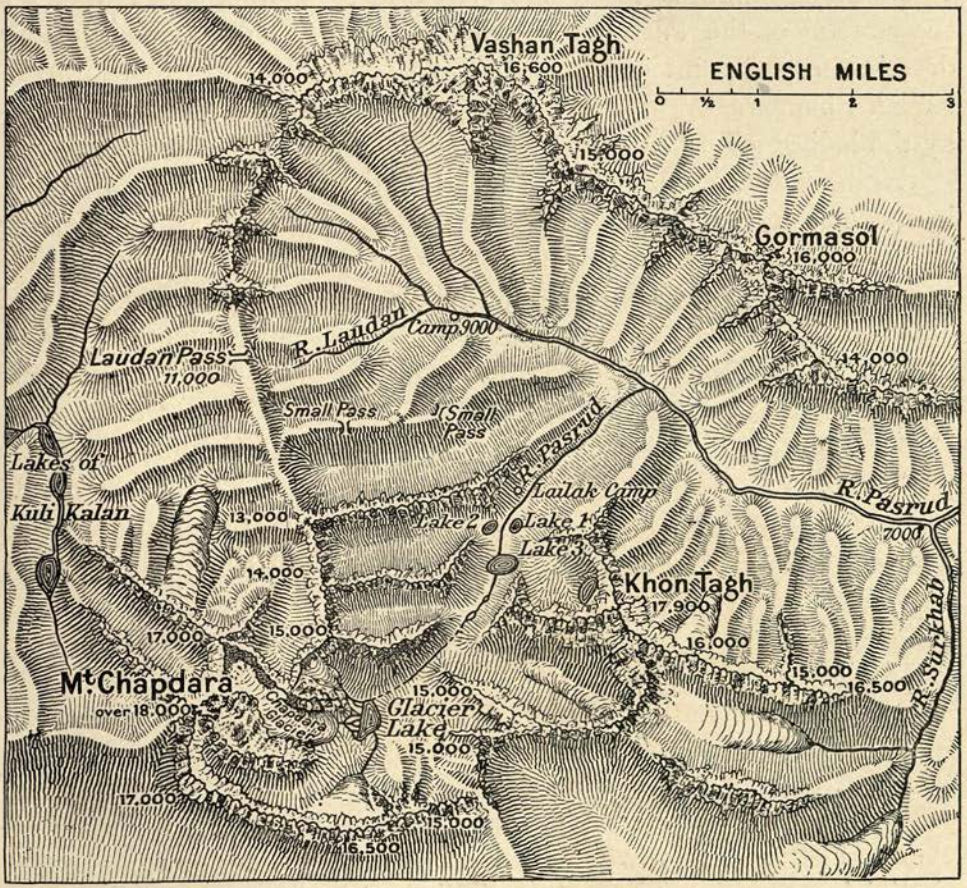


114. Awaiting Judgment.

dogs I felt hopelessly outnumbered. At this moment I was seized with poignant regret for having once tossed into the waste-paper basket the alluring letter from a professor of jiu-jitsu.

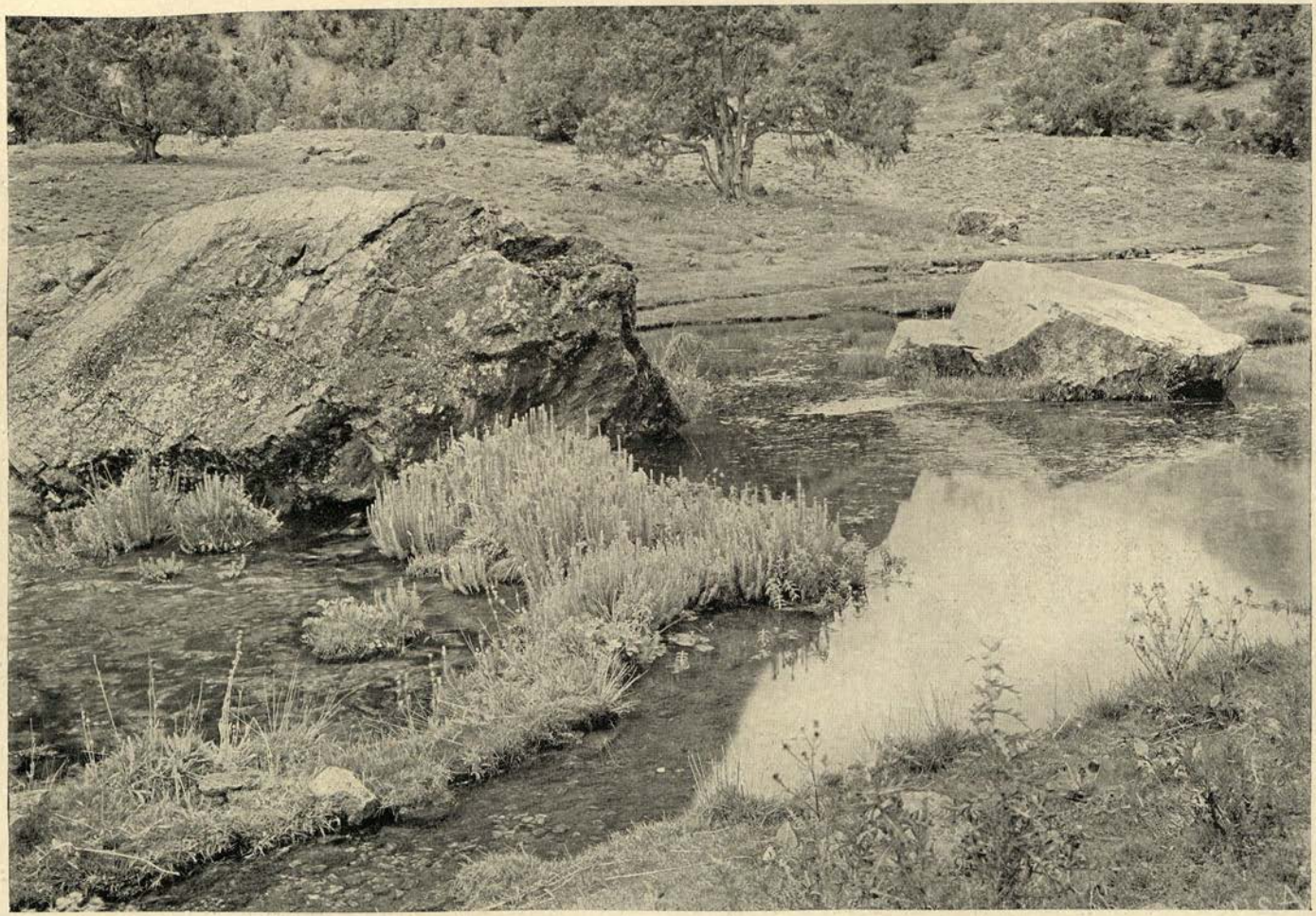
I became very polite and diplomatic, for diplomacy is when you daren't strike. Swallowing my rage and humiliation, I called a hearty greeting, something in the how-do-you-do-, glad-to-meet-you-style.

The *deus ex machina,* the great barber of the close shave, is a favourite figure of the novelist, but that fraction of a second by which we were saved was about the keenest edge he can ever have put on. What if Albert had not obeyed the ruling passion of the Tyrolese, or if I had not set my mind upon that view round the corner?

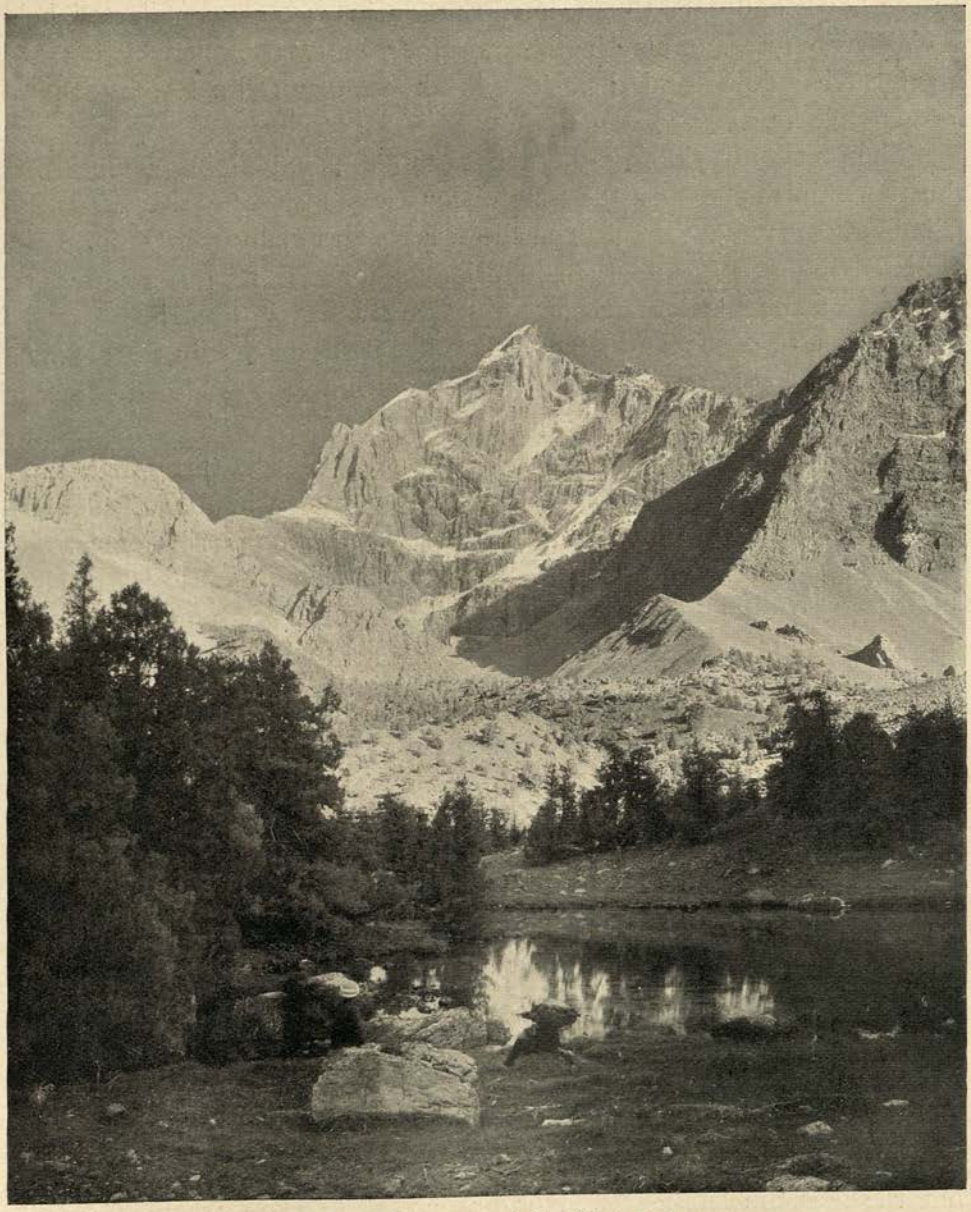


115. The Chapdara Mountains.

I was with difficulty prevented from snatching the rifle and letting fly after those rascals. But Albert said, he had only one cartridge as his intention had been to shoot only one marmot. But after I had given sufficient vent to my suppressed wrath I said, "To-morrow." He is the stronger man indeed, who, though beaten, can say "To-morrow."



116. Moorland Scenery at Lailak Chapdara.

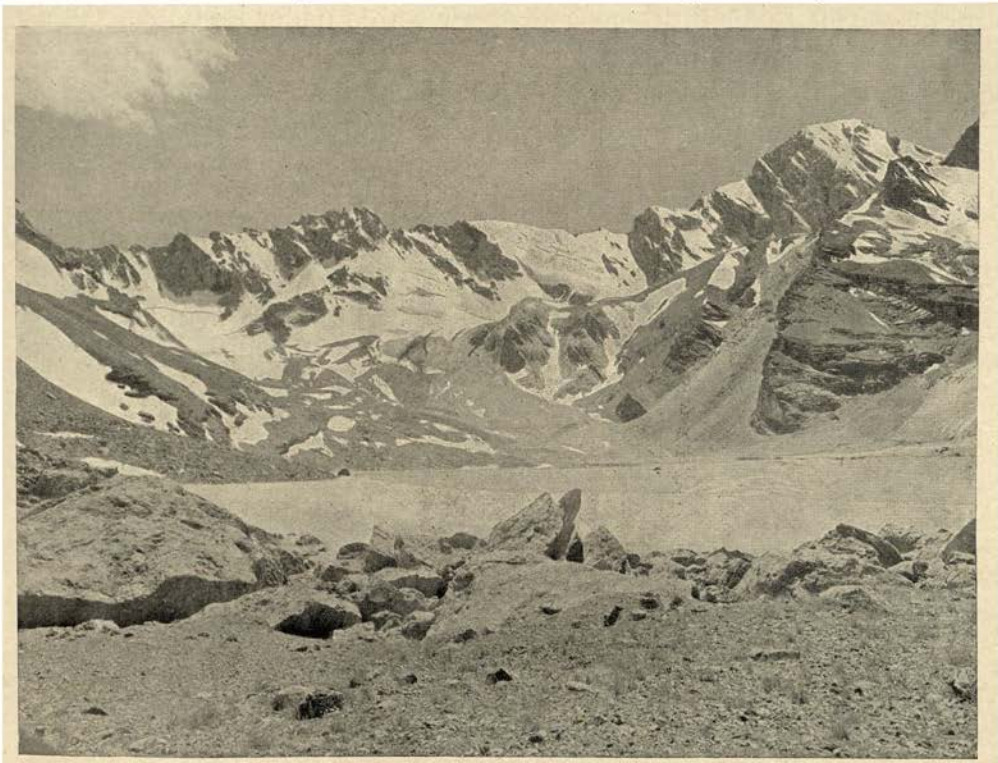


117. Khontagh and the First Lake.

118. Third Lake of the Pasrud Valley.

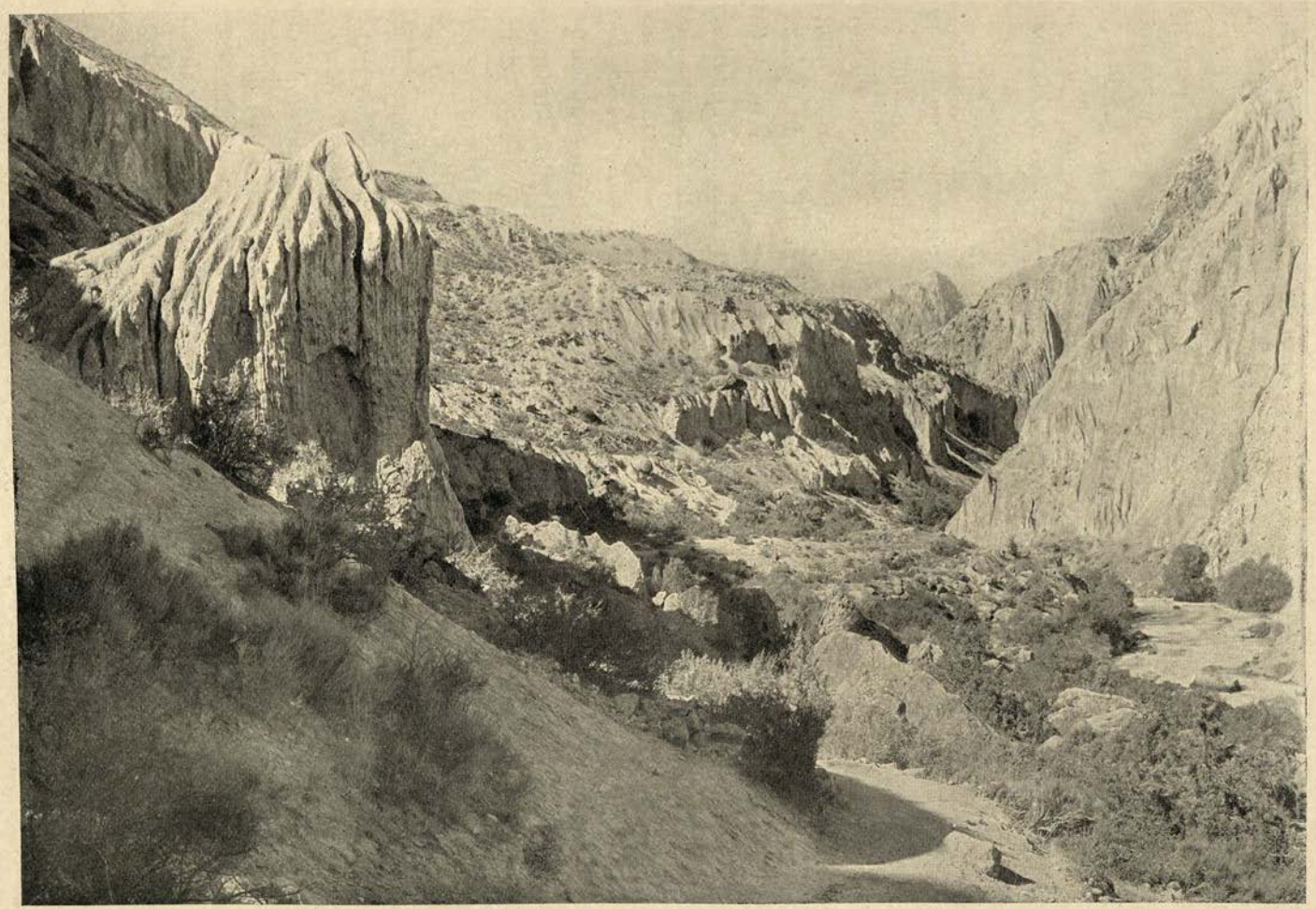
obtain a glimpse of the south-eastern aspect of Khontagh, an interminable flight of moraines and screes without a single speck of snow. Nothing but loose rubble, on which next day we spent six hours of steady plodding. In a moister climate, even under the same latitude, there would surely be névé.

At last we reach our goal at a height of 12,000 feet. We stand on comparatively level ground in the focus of a magnificent panorama of



119. The Pasrud Glaciers with the Glacier Lake.

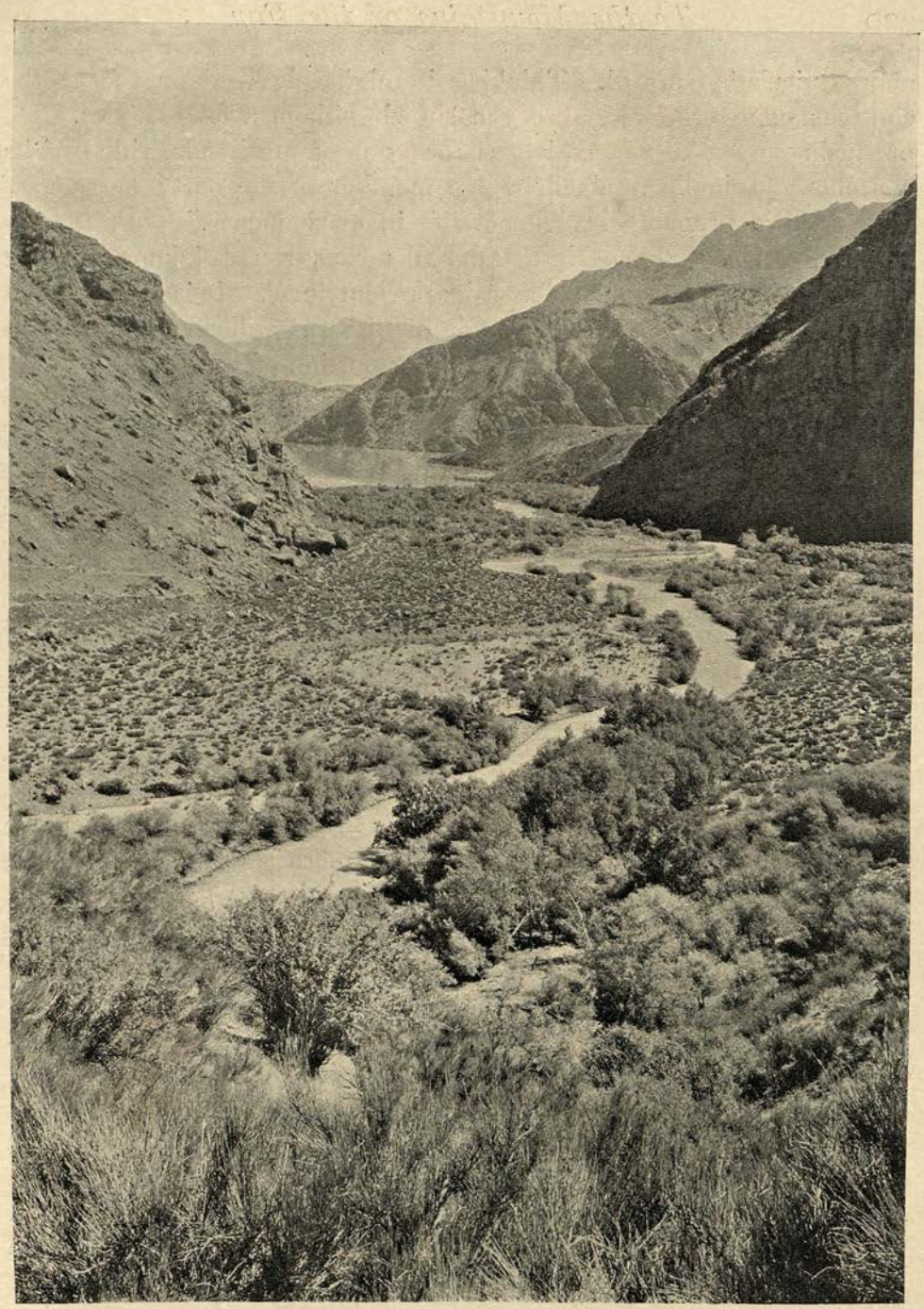
glaciated peaks. Before us a grey lake. Its opposite shore is a gravel delta covered with a network of countless channels. On our side is a miniature Norway, formed by the labyrinthine rocks of a terminal moraine that fall away into fjords of deep water. Fig. 119 shows the receding background of the amphitheatre. Its sides become steeper as they close in towards the entrance in which we stand. On the right the snout of the principal glacier is just visible, while still nearer to us, beyond the right rim of the picture rises one of the pillars flanking the



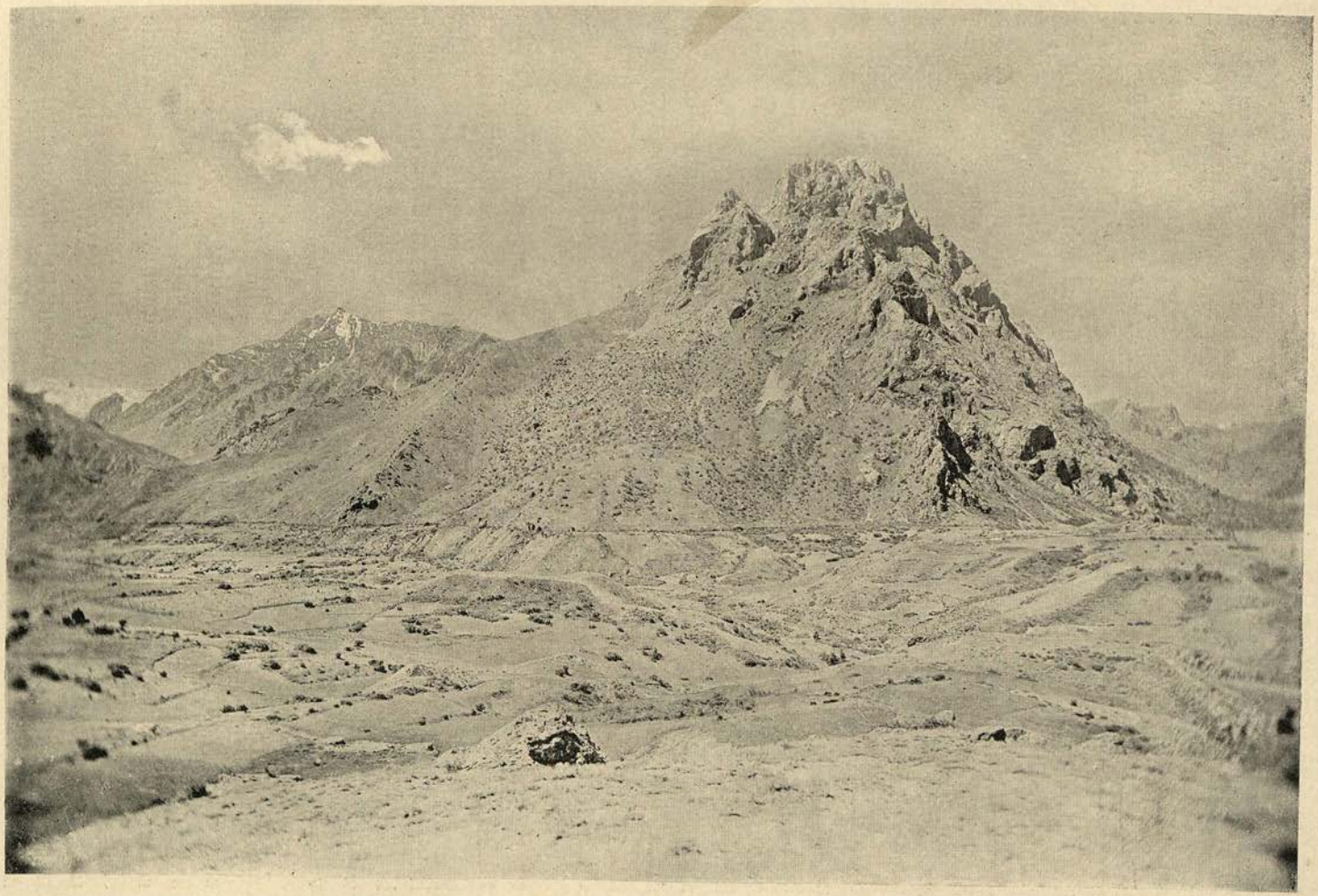
120. Boulderclay of the Iskander Valley.

121. Fluted Boulderclay.

122. Lake Iskander.

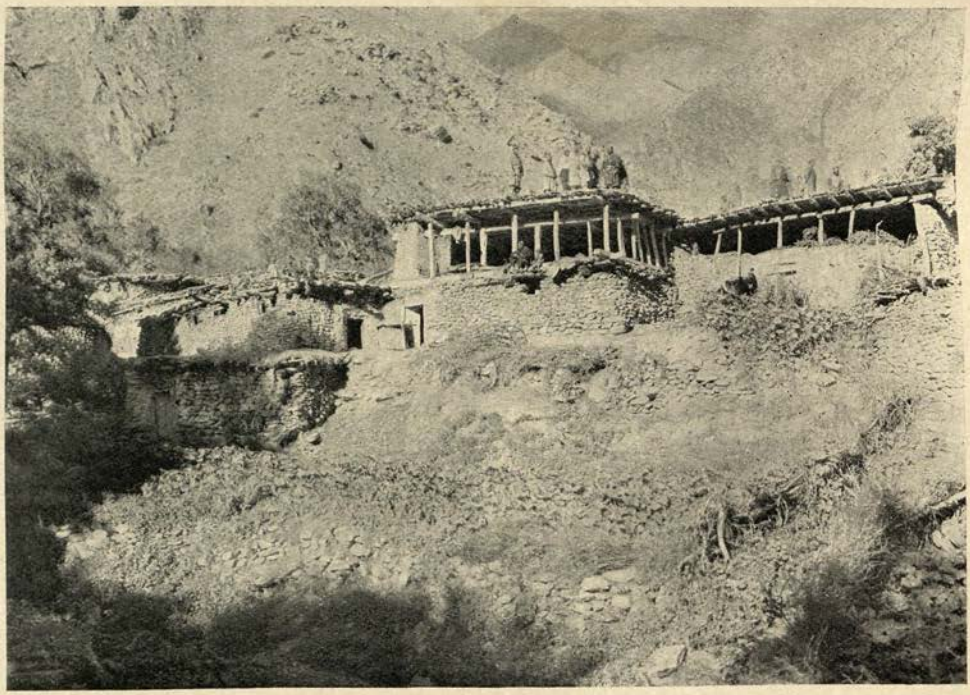


123. Looking towards Iskander-kul from the Saratagh Pass; Ephedra Steppe and Meanders.



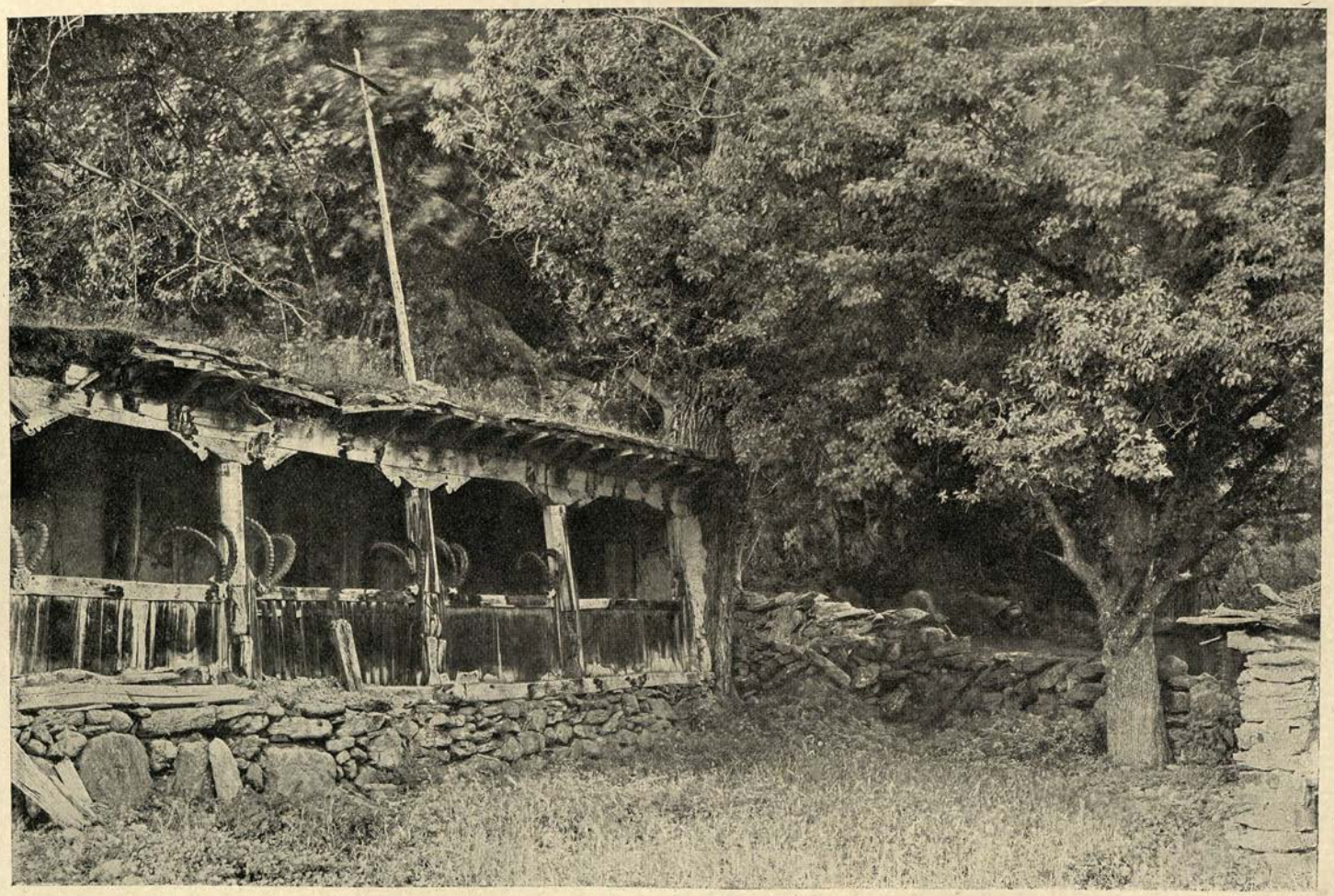
124. Basin of Saratagh seen from the Saratagh Pass.

whence crawled a fine twin glacier. This, the Bodravak glacier, had retreated from the flat bottom of the typical, U-shaped valley and was now confined to its highest glacial step. Its two broad arms united a few hundred feet above the foot of the declivity, proceeding only a very short distance into the level section of the valley. The trough recently occupied showed a distinct waste-mark to about a mile from the snout. Shrinkage had even affected the Bodravak peak up to its very top. Robbed of its support the triangular ice field of the summit



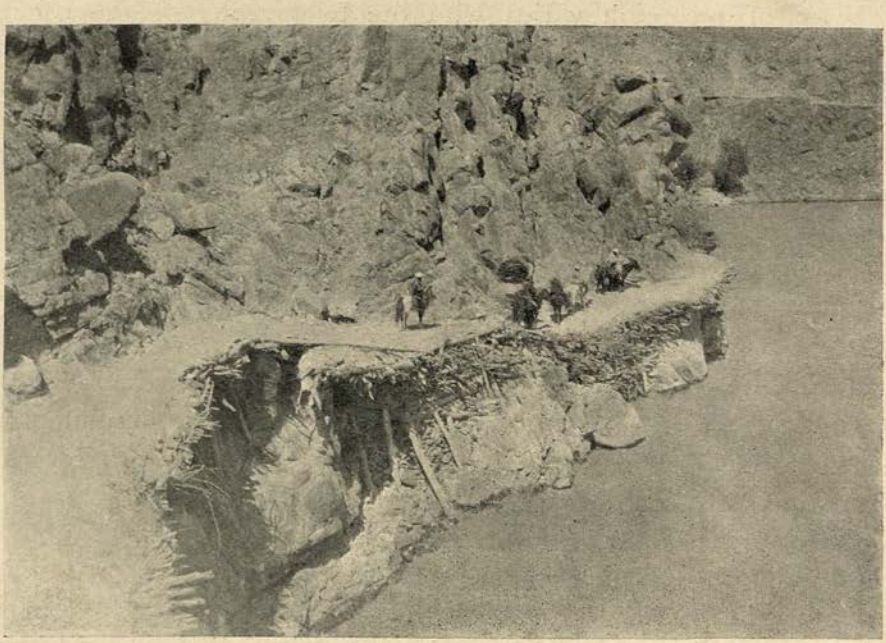
125. Gorif.

had settled and slipped off in several places. The valley turns down steeply towards the south, descending to Gorif by a series of glacial steps, as far as I could make out in the failing light. Its upper portion was filled with avalanche snow, already firmly settled and traversed by considerable crevasses. At a height of about 9000 feet we rode through a full-grown birchwood, having for underscrub the leaf clusters of an umbelliferous plant which, in the dusk, gave one the impression of bracken in the glens at home.



126. The Mazar at Gorif.

Such are the outward and visible signs of a hospitality which, through constant delay, can be as irksome as it is pleasing and comfortable. Apart from the painful necessity of liberal tips the dream of Oriental splendour is sometimes marred by an incongruous attempt at European get-up. I have already spoken of the tables which the midnight cat on its rambles will often cause to annihilate the space between the floor and the top with a loud crash. Of a piece with these is the red cotton often spread in the guest house instead of the native carpets. Soiled and torn in a very short time the red horror is



127. Balcony Road on the Surkhab.

enough to make a rag-tree weep with envy. In small doses such spells of luxurious life are extremely agreeable, more especially to the servants for whom they mean a holiday from the daily duties of camp life. Here the ordinary mortal may enjoy the evanescent pride of a royal progress, while realising to the full, how much a crowned head can see of true life beyond the swarm of satellites. We knew the inwardness of things and the lies behind the mask, yet it must be said that everything was done in such good style and graceful manner as to make one sincerely thankful. The cultivated Bokhariot is a polished gentleman

128. Siesta.

itself towards a row of blurred trees. Near by a burn with reddish sandstone water winds through the battered turf. Beyond is the fire of our servants glinting behind a veil, that muffles the low voices of talking companies and the sounds of a dotar (guitar). Men come and vanish in the fog, passing in between the silhouettes of our horses, whom we can hear neighing and snorting, rubbing their sides against a tree or turning their impatient circles around the pegs. Sometimes an astonished cow stumbles through brittle and crackling weeds on its

129. Sumptuous Quarters.

way to the village whence the odour of the evening meal creeps through a thorny hedge. In the far distance a mountain whaleback sketches an uncertain outline overhung by the lemon lamp globe of the rising moon. But looking straight up through the dry mist we see the pale blue of a fading sky dotted with a few white clouds.

Next day we had a fine impression of the Surkhab valley, where the broad gravel plain of the river with its network of channels lies full length between two mountain chains. The summit range of Alai is set far back, but the sheer and snow-streaked crest of Mount Sarikaudal

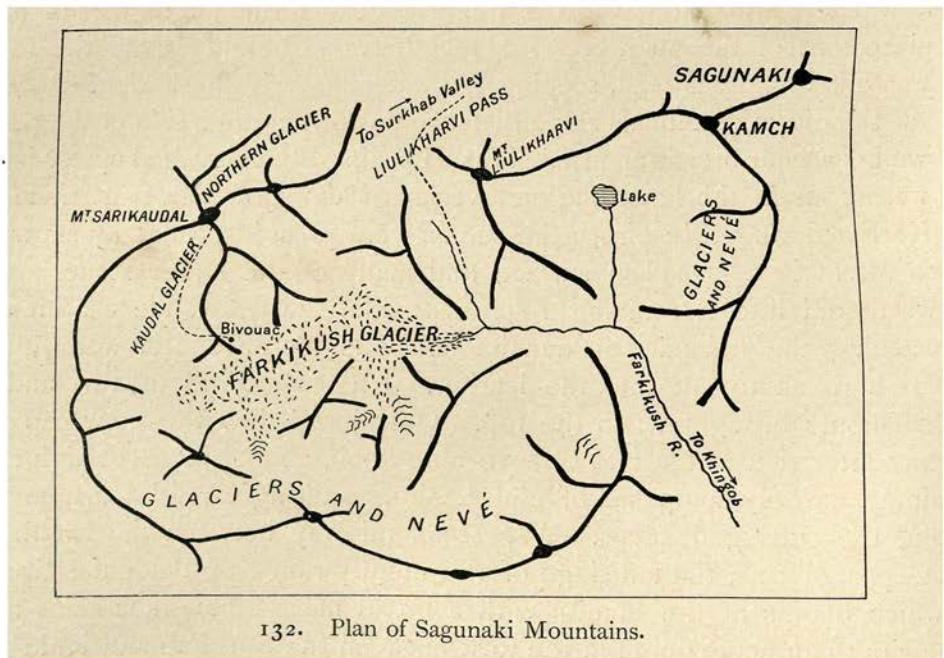
130. Mount Sarikaudal.—Yughan and Rose Scrub in the Foreground.

We are fortunately able to time the vagaries of the northern glacier of Sarikaudal, for in Lipski's book there is a photograph taken from almost the same standpoint, and showing that it was about a mile and a half longer in July 1897. According to the Russian's photograph it reached as far as the morainic bed is visible on my picture, but already in 1897 it shows a considerable waste-mark on the insides of the lateral dikes. In its then condition it also gives one the idea that the front half was beginning to detach itself by a waist, so as to be strung off and

131. Looking Eastward from Liulikharvi Peak.

left to wither, like the severed tentacle of a cuttle-fish. Referring to our record again, taken nine years later, it seems that a squat and rubble-smothered mass of "dead" or nearly dead ice is still extending to about half a mile from the present, vigorous and "live" snout. We dare not, however, make much chronological use of this glacier for dating the retreat of the Zarafshan and others, having to reckon with the likelihood that huge masses of ice and névé may slip off bodily from the precipitous flanks of Sarikaudal, thus leading to a sudden increase of the glacier. Moreover, with its elongated channel, it will translate

The mountains are coloured here on a grand scale, one of them being quite purple, with patches of luscious green grass kept fresh by water trickling from large strips of white snow. If it did not look gorgeous one would call it a shame that a big, grown-up mountain of 15,000 feet should paint in so outrageous a fashion. A tarn embedded in morainic wreckage seemed filled with viscid red lead, adding glacier blood to our list which already contains glacier milk, glacier ink and glacier soup. What would have been the object of greatest interest, the file of Alai, marching from west to east, was dissolved in a trembling



132. Plan of Sagunaki Mountains.

haze. For a long time we watched a couple of lämmergeiers playing and billing as they sailed past the slopes.

Running down a series of couloirs filled with fragments of soft slate, towards the Farkikush, we joined our horses far below the pass, and were soon engulfed in narrow gorges choked with avalanche snow, a very unwelcome contrast to the amiable openness of the Surkhab side. Knowing that water is rummaging under the white pavement makes one feel creepy down the spine, especially when broken portions of the vault unlock the roaring terrors of the underworld. It is not always possible to escape to the slimy rubble and slippery rocks of the banks,

so that his conscience pricks the mountaineer, who allows his caravan to pass unroped. One hardly risks a peep into these holes where the red rush of the torrent is seen to vent its fury against the polished sandstone. Fortunately the snowy mass is firmly crammed into the gorge and sometimes so thick as to make inaudible the thunder of the glacier stream. In early summer, when the pass is first opened, the southern approach must also be very convenient, forming, then, an uninterrupted and easy road of snow, while the last travellers in late

133. Stratification and Cleavage.

autumn, have to pick their precarious way from side to side over treacherous snow bridges. Debouching into a wider part of the Farkikush valley we found a convenient camping site on a terrace covered with yughan scrub and crippled trees. Here a dozen peasants awaited us, sent up by the Amlakdar of the Khingob with offerings of bread and salt, butter, legs of mutton, eggs, omelettes, cake, and milk. Near this place, on the left bank, occurs a remarkable instance of stratification with joint planes and cleavage (Fig. 133). Fine cracks,

absolutely straight like lines drawn on a sheet of paper, traverse the slabs parallel and at right angles to the strike. Into these fissures grass has grown, marking them off with greater clearness.

On the following day, having set our minds upon Sarikaudal, we rode to the upper reaches of the Farkikush. Once past the Liulikharvi ravine the valley floor became continuous, but also very dirty. We were on a regular avalanche glacier, as proved by the age of its mass, its crevasses, potholes (moulins) and moraines. It may be said to form a continuation to the névé glacier pushed out of the upper basin, but

134. Mudspates on the Snow.

not endowed with sufficient force to reach so far down. Hence we have the case of a valley glacier made directly out of snow and supplied at intervals. Longitudinal advance must be exceedingly slow or practically absent, because there is no steady shoving from behind, and a fresh block occurs in front every year from the avalanches wedged into the narrow gorge. Annual feeding maintains the level of its surface, so that increase or retreat would be paramountly expressed by changes of thickness instead of length. Throughout the whole stretch, from the lower snow arches to the fields of névé, I have never been able to tell

striking sights was offered by mudspates poured out over hard snow from an adjacent slope of soft screes (Fig. 134). These thick, ruddy snakes stood out like mounted specimens from a white table; they were experiments on a large scale, showing the shape and dynamics of the mud gush, unobscured by any transition from the moving material to that of the substratum. Linear growth by self-bedding could not be better illustrated.

As far as I could determine with a probability approaching certainty, the main glacier, or what should be the main glacier, is disjointed in a

135. Mount Sarikaudal with the Kaudal Glacier.

curious way. The right tributary ice stream opposite our bivouac (Fig. 132) runs some distance down into the main valley, but is not connected with the glacier coming behind it from the west and just missing it by a couple of hundred yards. Likewise the next lower glacier on the right curves into the trunk just escaping the end of its higher, westerly brother. Having built a wind screen at a spot selected for our bivouac, we went to reconnoitre our route for to-morrow's ascent, at the same time examining the Kaudal glacier (Fig. 135). We found

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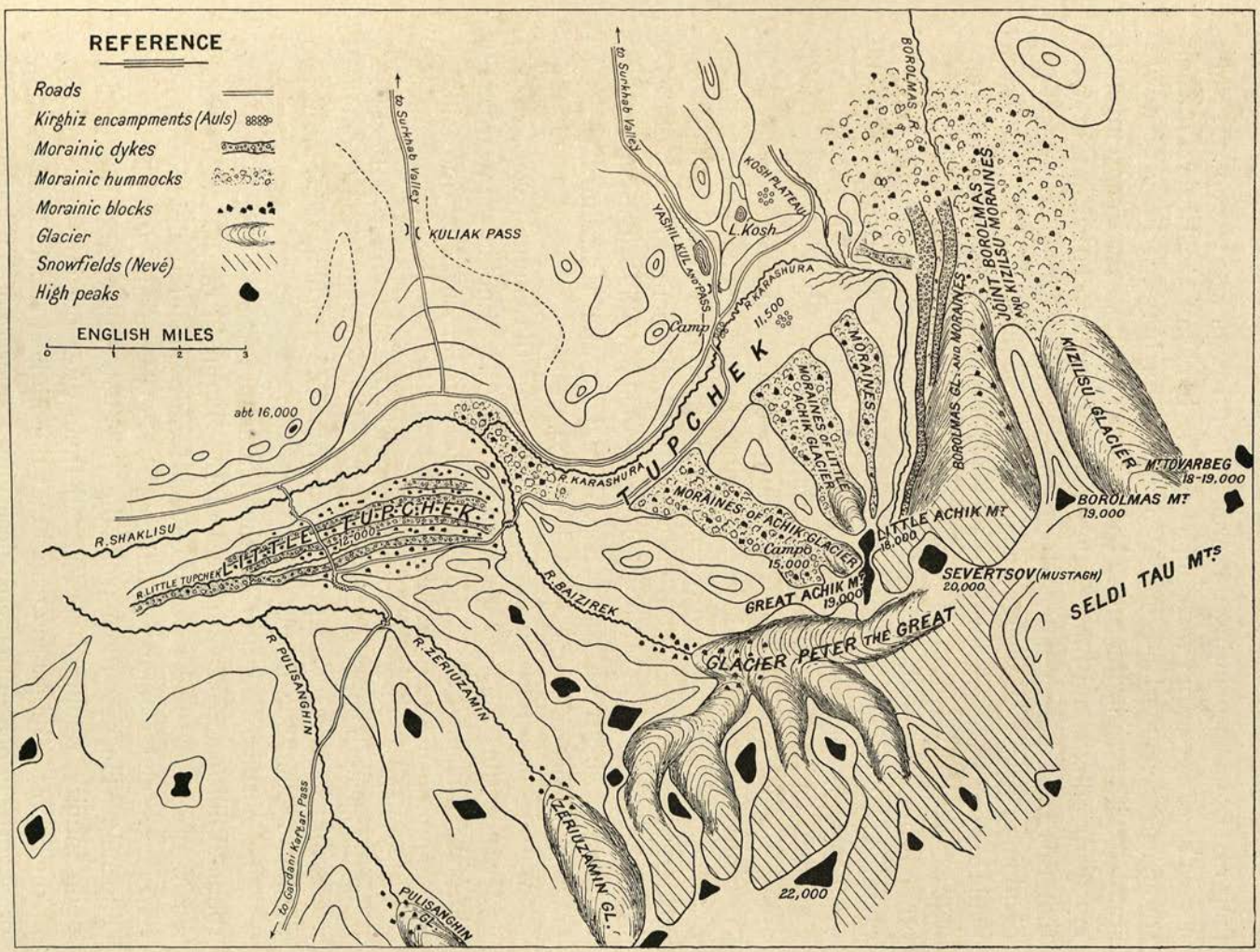
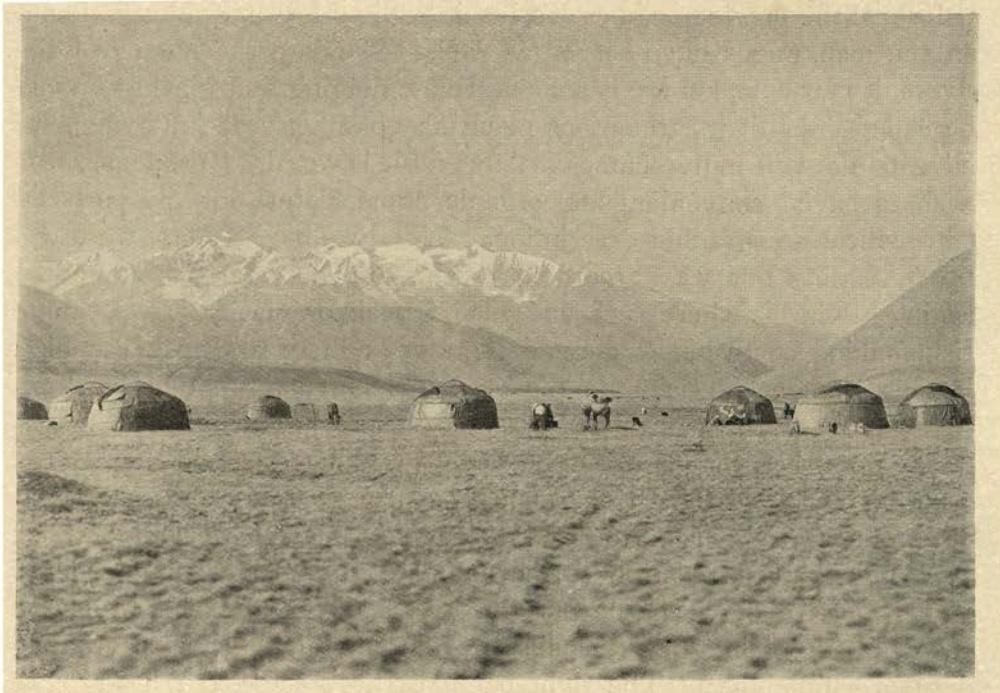


137. Plan of Tupchek.

identified Mount Severtsov with the imposing pyramid of ice which dominates the others. Lipski calls it Mustagh, but as this simply means ice mountain, it is perhaps better that such an uncompromising determination should not figure on the map. True, the giving of personal names should be avoided, but once the thing has been done in honour of a great man, it cannot very well be cancelled.

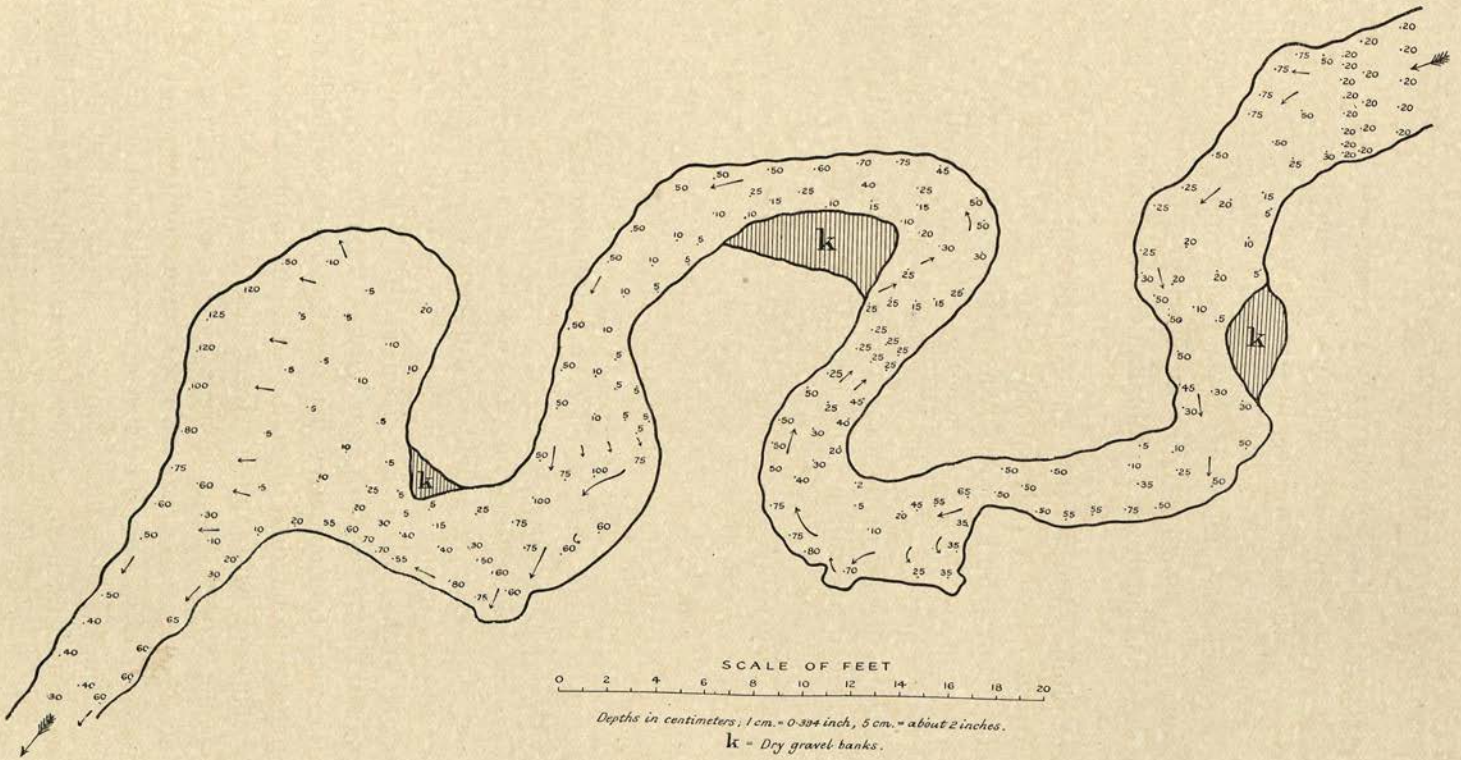
West of Severtsov are the two Achiks (to the right, on Fig. 153); to the east follow Borolmas, Tovarbeg (Fig. 151) and a long line of



138. The Pamir of Tupchek (Karashura Plain); Looking Southwest.

other mountains, stretching away on the left bank of the Muksu in the direction of the Pamirs. This range, ending with Achik, is called Seldi-tau on the Russian map, but the topography still wants clearing up, for these summits are separated by deep valleys eaten far into the background. They are either the promontories of spurs from a main divide, or a more complicated arrangement prevails. From the Seldi-tau a great number of parallel glacier valleys debouch at right angles upon the Muksu. From west to east their names, as given by Lipski, are Borolmas, Kizilsu, Koshkul, Seldara, and Oshanin. I am

139. Karashura Plain (Tupchek) and Little Achik Moraine, from Yashilkul.



140. Meanders of the Karashura in September 1906.

from a favourable viewpoint we can still see the slight swellings of shallow deltas. Where the sole of the plain is lowest and nearly horizontal it is generally moist, often boggy, forming a greenish belt fitted to the basal contours of fans and slopes. This strip more or less corresponds to the flood-plain of the river which runs nearer the right (north-western) margin of the valley, having been forced there by the greater influx of rubble from the Achik side. Wherever the

141. Oxbow Curve (Meander) of Karashura. Accumulation at inside of arc; compare Fig. 140.

ground dips ever so slightly it is quite dry and tunnelled by marmots and other rodents.

Searching for the watershed and the Karashura sources, we march in a north-easterly direction. The green, swampy band narrows, the cushioned border of the streamlet changing into a gravelly beach, until finally there is nothing but a corrugated steppe of low welts and channels. The supply of the Karashura is easily traced to a valley held between the old Borolmas moraines—a cataract of hills—and the mountain slope (Figs. 137, 143). On the cone delta, projected from the

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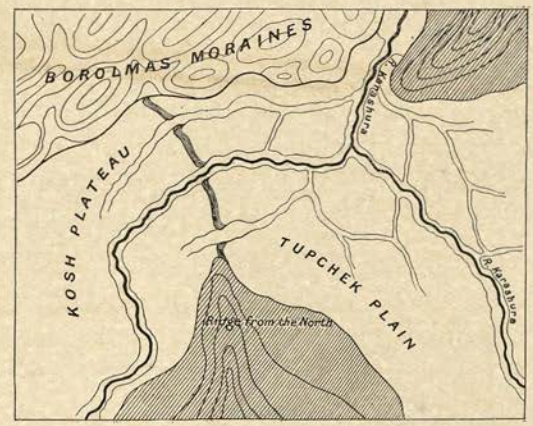
undercut the slopes of its own deep valley, provides the affluent with steeper gradients for its attack upon the tier, whereas the Kosh plateau is but a poor base level of erosive operations against the top storey of Tupchek.

This shows the effect of joint forces as applied to the relations of a river to its tributaries. The main trunk, by deepening its gorge, stimulates the feeders into greater energy, enabling them to accomplish more destruction than they could have wrought if they did not belong to an organised system. But, as in all things, such conditions hold good only locally and for a certain time, the increase of denudation or transport in one place being compensated by corresponding reduction in another section. The invigorated side streams carry more rock waste down their acuter declivities, thus burdening the master river at an early stage of its career, obliging it to begin deposition much sooner than it would otherwise have done. Hence, all things, such as hardness of rock and precipitation being equal, and tectonic uplifts ruled out, the theoretical day of absolute levelling of the heights should come at the same time to non-union and to organised rivers. Ten weak runlets debouching upon a plain will always retain an even gradient to the bottom of the slope; each spreading its sediment unhampered by the other; in common they will build up the lesser slope, which is to be the mountain of a still gentler one, and so on with infinite approximation to the ideal plain. On the other hand, if these ten streams join together, their trunk will make a gorge whereby the base of erosion is brought much nearer below their sources, so that they can strip their steepened inclines far more rapidly. But the reaction is sure to come, for the big river washes forward more detritus, and all through one outlet, thereby raising a vast conical plain which must ultimately grow into the gorge and up to the slopes of the ten affluents.



143. Bifurcation of the Karashura.

cut to the valley of Karategin. Similarly the old Inn glacier of the Eastern Alps sent branches into the Bavarian highlands over passes on its left bank.

Another excursion was made to the ridge of Little Achik overlooking the Borolmas glacier. Ascending by the north-easternmost and smallest of the three moraine-filled ravines we surprised three wolves which trotted off in haste over the snow-fields. These prowlers seem to abound in the neighbourhood, for at another time we saw one of them chased away from the aul by the watchful Kirghiz after an unsuccessful attempt on their sheep. The wolves are always eager to take a bite of plump mutton, and the expression can even be taken literally, for it sometimes happens that a piece is torn from the fat appendage, leaving the sheep apparently none the worse for this loss of palatable substance.

144. Kirghiz Women bearing offerings.

On the top of the ridge we found ourselves immediately in front of the pyramid of Mount Severtsov, flanked on either side by grand, glaciated corries. The great slab of summit ice with its broken lower edge seems to stick precariously to the slanting rock. Catastrophal ice-slides like that of the Altels suggest themselves, with their irregular feeding of the glacier below. At our feet the latter presented itself as the usual mixture of ice and rubble, but gradually transformed into a majestic flow of old moraine. The total length of the Borolmas, its living and dead portions considered as one individual, is about eight miles from the back of the corrie to the end at Kosh, the difference of level being roughly 2000 feet (Figs. 145, 146). It is a fine sight of outstretched and plastic regularity; a ponderous yet magnificent dragon, its sinuous body lying firmly in a bed of mountains, its warty head nosing the distant gorge. The dikes of moraine, graded in different shades according to age, wind in many curves towards the bosses and humps which overlap the plain of Kosh. The left lateral moraine (Fig. 154) is especially well preserved, stretching away in

145. The Borolmas Glacier and the Alai Range.

a prolonged stay, for we cannot get acclimatised to violent starvation of any kind, be it food hunger or oxygen hunger.

As to physical means, we must remember that brute force or the training of an oarsman (for races) do not weigh in the balance against a reserve of adipose tissue and latent energy. The mental state of the mountaineer is also of utmost importance. He ought to diet his soul with equanimity, directing his attention in the valley towards finding as easy a task as possible, after which an Oriental repose of mind should be cultivated. The choice of an easy mountain is therefore imperative. It is a proud thing to overcome obstacles, but it is also very disagreeable to know that those difficulties below you, the steep ice slope, the rotten rocks, or toppling séracs may endanger retreat. This anxiety of how to get down speedily when tired or overtaken by a change of weather, may sap one's confidence and energy. Ambitious struggling is futile without the most careful assembly of all favourable factors and conditions. Body and mind should be perfectly fresh and in a state of calm deliberation, founded on a conviction that nothing unforeseen can happen, that the road is clear. One must patiently search and wait for the lucky combination of practicable slopes, good weather, personal fitness, and a happy mood.

146. Head of Borolmas Glacier; Eastern Corrie.

Those giant monsters must be courted with languid ceremony, followed by quick persuasion at the psychological moment, the general advice being the same as to stalkers of live game: lie down and wait for a sure shot. One might also to great advantage cherish the pleasant illusion that one has come out to enjoy oneself, which is a miraculous guide to all the best treasures nature can yield up. Obeying these maxims we were able to climb three fine peaks without undue sacrifice of time and energy.

On September 12 we started from Tupchek, riding in about three

hours to a good camping place among the youngest moraines of the Great Achik glacier, which to-day is nothing more than an ice-field, though its old moraines and hummocks descend into the Karashura plain. Here, at a height of 15,000 feet, we emerge upon a platform with red blocks disposed among a garden of turf and flowers. Here also grew a whitish lichen which favoured the tops of large rocks, making them look as if they had been sprinkled with lime. A colossal boulder sheltered our tent from a restless breeze. This rocky screen was cleft by a chimney deserving of the name, for it did good service by sucking in the smoke of our fire. As fuel we had a horseload of wormwood, on which the Kirghiz depend for their kitchens, tearing it up together with its ligneous roots. Supper consisted of dried cream, curds and bread, while rice boiled in milk and apricot jam were served for breakfast, tea being, of course, our daily drink at all meals. I never took much in the way of tinned meat on these journeys, because mutton and dairy produce are obtainable nearly everywhere. On the other hand I laid in a good store of Russian fruit preserves, a kind of jam, and not too sweet. They proved a godsend in the mountain valleys where vegetables are almost unknown. Tinned fish or meat were only kept for emergencies when cooking could not be done, or cold dishes had not been prepared beforehand. What one always needs and ought never to run out of are tea, sugar, jam, chocolate, a few condiments, and tobacco. With these, and the fat, or lean, of the land, one can always evolve a manifold bill of fare.

147. Our Achik Camp; Morainic Boulder.

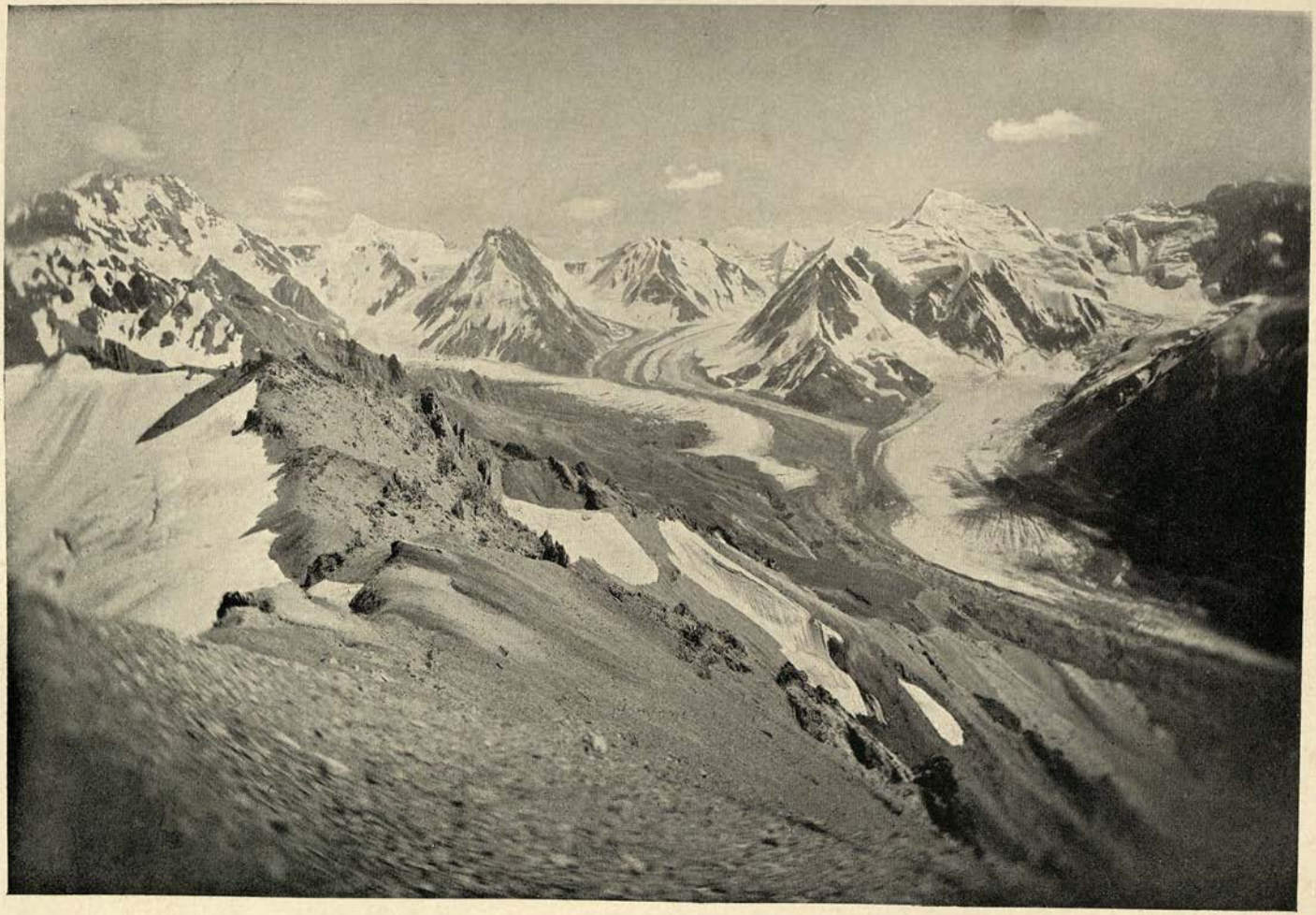
The glacier, or what remains of it, forms the outrun of a wide but steepish névé gully between Great and Little Achik. Making for this couloir, at 5 a.m., we scaled the hard snow with crampons on our feet, gaining height very quickly. Only a few steps were cut somewhere near the middle, where a small icefall had to be dodged. From the saddle a broad and gentle back of snow led straight towards our

In the Duab the snow-cloak of the monarchs is very ragged, hanging but loosely together and dropping tattered fringes over spiky ribs. Strips of moving ice are close to naked rocks exposed to a scorching sun in a dry atmosphere, and under a sky which is clear for a hundred summer days. At night the cold of planetary space darts through the limpid air, gripping the overheated stone, so that it shrinks and shivers with sudden spasm. No wonder then that here we see so much evidence of glacial erosion, for here the dry weathering of the desert is joined to the weighting and sliding of alpine ice in such a way, as to allow each the maximum force possible in such a union. They even hardly interfere, the desert enjoying more or less a free hand in summer and early autumn, while the snow falls during seasons of the lesser sun. The result of this fearful alliance is a power for destruction undreamt of in the Alps.

148. Great Achik.

Turning towards our bivouac, we trace the present decline and past career of the Great Achik glacier, great alas no more, beginning with its dirty little tongue licking the last residuum of former greatness, an outpour of red stone as from a monstrous pot of blood upset. Then furrows amid welts of grass like a crawling swarm of snakes or lizards, striped green and red. And finally the descending wallow of morainic bulges akin to the stiffened nodules of a guttering candle.

It being early in the day, we lingered over the feast spread to our gaze, before going down. The ridge became still easier and gradually changed into a comfortable whale-back, thickly padded with a grit of thin scales of frittered slate. This material is a kind of residual soil,



149. The Glacier of Peter the Great.

points to a great height above sea-level, treelessness, and absence of cultivation. Finally, we expect the neighbourhood of the snowy peaks and ranges of an "alpine district," in order to complete the landscape of a pamir. Although the definition is one of outward aspect, and cannot be made dependent upon genetic principles, it goes almost without saying that a pamir will usually have a glacial significance, it being, on the whole, impossible to imagine the origin of wide valleys at great height without the help of glacial factors. Most pamirs are

150. Rainbow Grit on Mount Achik.

troughs deeply choked with morainic detritus, which the rivers have not yet been able to remove, owing to an insufficient water supply. Consequently they are bound to play a rôle in every discussion of the interesting problem of the desiccation of Inner Asia, maybe furnishing some day important clues towards its solution.

Not having been on the great Pamirs myself I shall dismiss them with a short topographical summary. One usually counts eight of them, such as the Great Pamir, Little Pamir, Alichur Pamir, etc.

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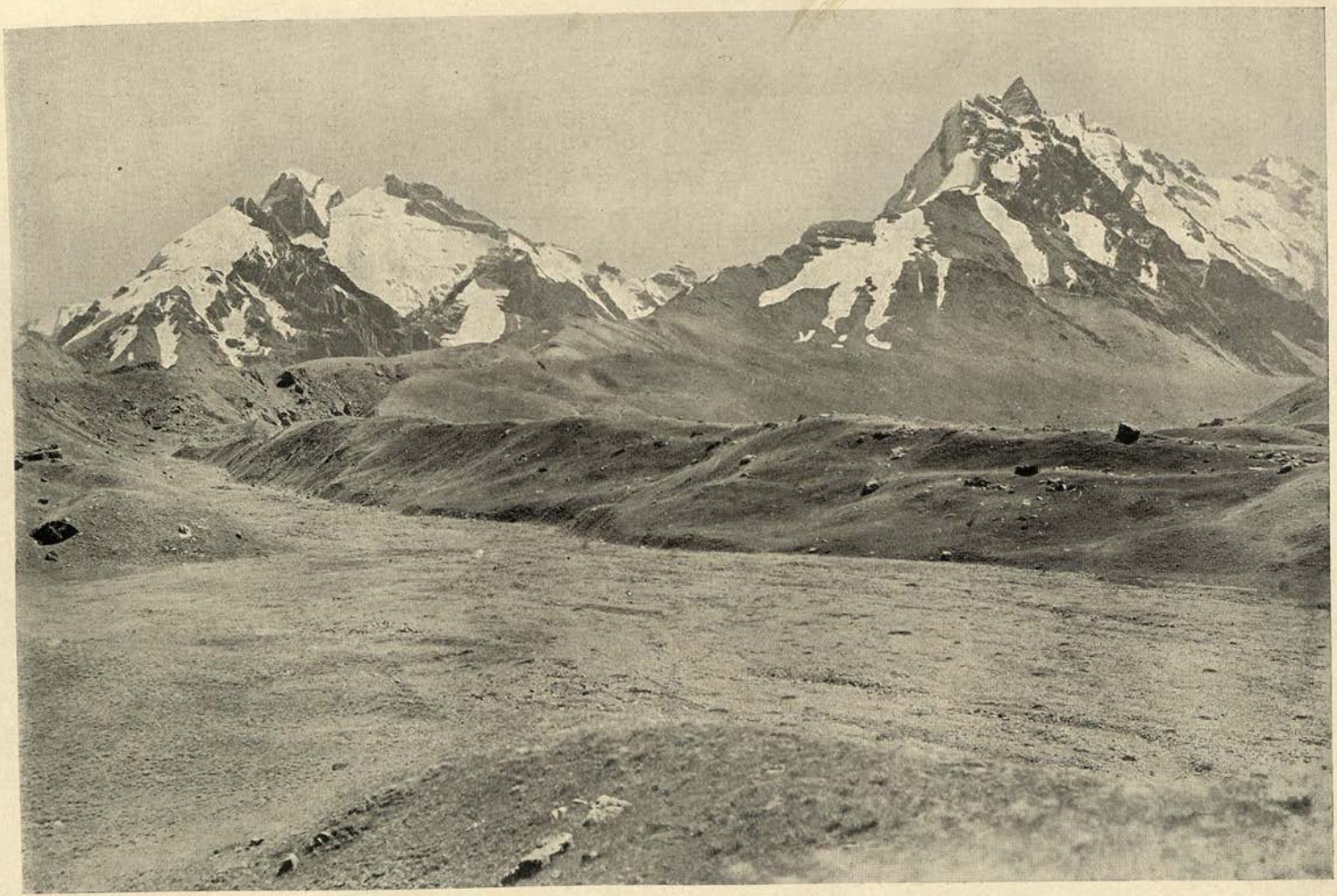
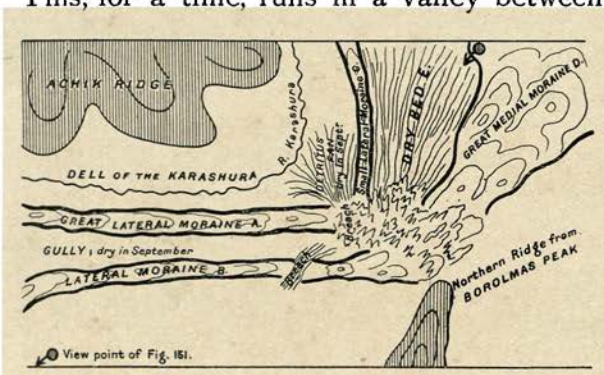


151. Tovarbeg (on left) and Borolmas Peaks; Borolmas Moraines and the Dry Bed in Foreground.

nearly 400 feet high, is also remarkable in so far as it forms the watershed between Khingob and Surkhab. Before occupying ourselves with further detail, let us examine Fig. 146, which takes us to one of the grand cirques or corries at the head of the glacier. On the right is Mount Severtsov; near us the great lateral moraine clearly distinguished up to its beginning under a black spur descending from the Achik ridge. Behind this spur is the dirty ice bulge of the glacier branch from the western corrie (here invisible) between Severtsov and Achik. As already described by Lipski, the union is very sluggish, only part of the ice connecting with the eastern contributory, while the greater half, probably screened off by old moraine, ends in the dark terminal face, whence issues a small stream. This, for a time, runs in a valley between older and younger lateral moraines (Fig. 154), afterwards losing itself by percolation among rubble and ice, joining other waters on their road towards the Muksu. Lack of time prevented me from finding out where exactly the Borolmas river emerges, but Lipski saw it somewhere east of Kosh. The Karashura is fed by the snows and springs on the flanks of the Achik ridge, the great lateral moraine deflecting the water into the Tupchek plain.



152. Borolmas Moraines.

We now return to Fig. 151, studying the state of affairs in connection with the diagram Fig. 152. In the foreground between us and the small moraine C is a flat piece of ground or dry bed E. Its even floor, composed of angular detritus and thinly overgrown with the vegetation of the steppe, lies about 150 feet higher than the adjoining reach of the Karashura. Its lower end is narrow, showing signs of forcible erosion. Undoubtedly it is the wash deposit of a glacier stream. Disturbances have taken place in the neighbourhood of the spot where the small lateral moraine C turns off sharply from the huge dam of A. The connections are severed and we behold a

is dead at one end, and very much alive at the other, where its icefalls thunder. In between it is "dead and alive." The transition from ancient moraine to recent glacier is so gradual that it becomes quite impossible to define a boundary. When using the term "glacier" in this neighbourhood one cannot help thinking of the entire combined length of ice *and* moraine, no matter how old. Smothered under a burden for which it cannot find a dump, the glacier squeezes itself laboriously forward as well as it can, forming a mixture, half stones,

153. Mount Severtsov.—Lower Portion of Borolmas Moraines in Foreground.

half ice, towards the end. No wonder then that it gradually raises itself by working surface rubbish, swallowed by crevasses, into its bed of ground moraine. Consequently the topography of this labyrinth is very unstable in the middle region of the glacier, while the older morainic landscape, forming a direct continuation of the more recent dams and cones, is closely affected by all changes in the upper reach. Whatever happens to the ice configuration of a modern Alpine glacier, its waters usually meet again on an old washplain or in an intervening

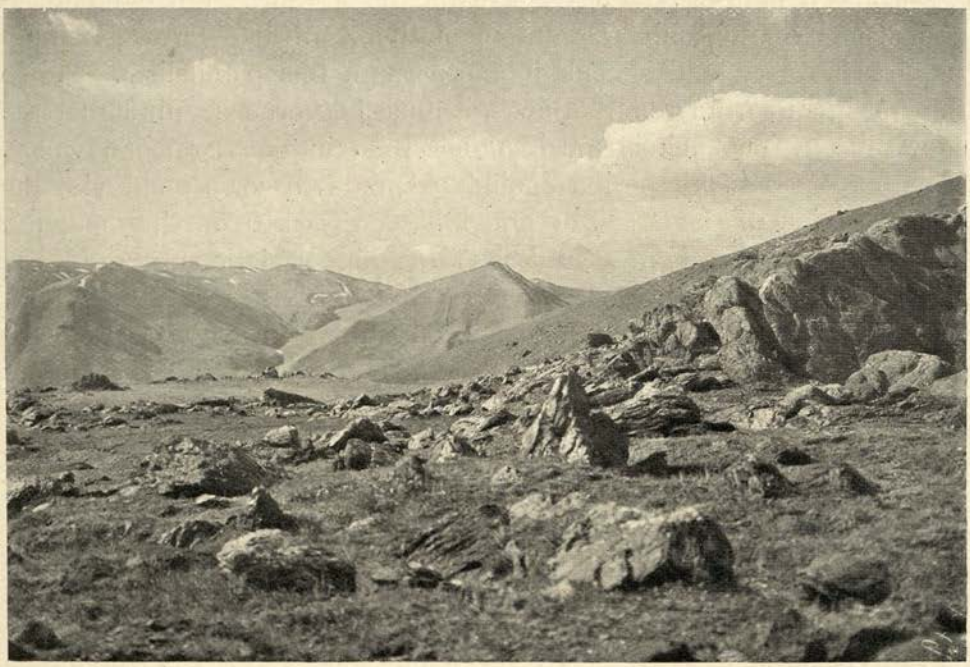
valley stretch, entering the distant and isolated deposit of old moraines by a fixed passage. Here, there is continuity, and therefore much community of disarrangement. If a big load of rubble slips from a cone, if an ice wall crumbles, or a tunnel collapses, new ways may be shown to the water courses. These new channels will often mean the forsaking of old beds and the making of new ones in the ancient moraines so closely bound up with the fate of the active glacier. That the changes just described habitually concentrated their effect upon the point of junction of the two glaciers (Borolmas and Kizilsu) is easily understood, for here is a weak spot where the least difference of level will weigh heavily in the watershed balance. When I saw the Borolmas

154. Old and younger Lateral Moraines of Borolmas Glacier.

glacier, the lowest ice appeared to be about level with the end of the ridge from Borolmas peak. Lipski's report seems to corroborate this observation.

Since the formation of its great lateral moraine A the Borolmas glacier (i.e. above its junction with the Kizilsu) has never stepped beyond it. Subsequent lateral moraines have been telescoped into the outer ones, while Fig. 145 shows concentric crescents of more recent stages of retreat within the innermost zone. In Fig. 154 we see how the great moraine sends a long slope far down to the left, to the Karashura dell. Inside is a later one (B), while on the extreme right is a portion of the big, crater-like funnel identified near

accumulations, without the intervention of a wash deposit (cf. Fig. 139). All three being practically the same as regards the formation of their valleys and the present state of their glaciers, I shall only describe that of the Great Achik. Its smooth, bulging plasticity, as it pours forth its solid volume into the flat expanse below, is a striking sight indeed. With the exception of a deep nullah or two, and a slight washing out of the margins, the whole heap of disembowelled mountain lies undisturbed, an assembly of billows and swellings. Its upper end is formed



155. Looking Northwest from Achik Camp.

by a stage or platform marking the beginning of a period of rapid retreat. This flat place strewn with boulders of surface moraine is shown in Fig. 155, the view passing freely over the brink, with its steep gradient, to the hills on the northern side of the Karashura steppe. Lower down the moraine also contains blocks, but fewer in number, most of them having been worked into the finer material. Turning entirely round we face Great Achik and its snow fields which give birth to a stunted glacier. This miserable bit of ice is all that remains of the stately cascade that carried down and moulded the

filling out its bed and carrying very little surface dirt (Fig. 149). What I wish to urge above all is, that we have here the largest area of alimentation in the neighbourhood, a fact to be borne in mind with a view to what follows.

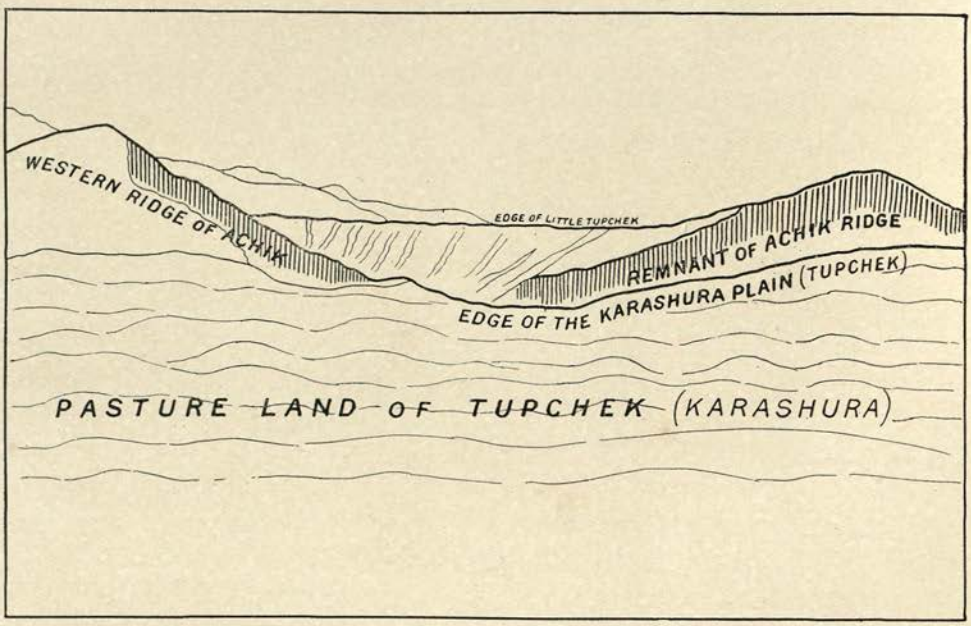
I am now going to describe the phenomenon of the "isolated" moraines of Little Tupchek. This might be called a classical example; classical because it is simple. Nature's methods are simple, but she has been working on the same old material of the earth's crust for

156. Edge of Little Tupchek seen from the Karashura Plain.—Compare Figs. 157 and 158.

such a long time that the deciphering of her palimpsests is often a hopeless task. One feels grateful for documents writ large. Like the stone of Rosetta they form the safe foundations of research.

First let us take up a position at the western end of the Karashura plain as indicated by the dot and arrow A on Fig. 158. From here we see the view of Fig. 156, and Fig. 157 is a tracing of this view. On the left and right are two pyramids which plainly tell the fact that they are built of solid rock. The one on the right is on the other

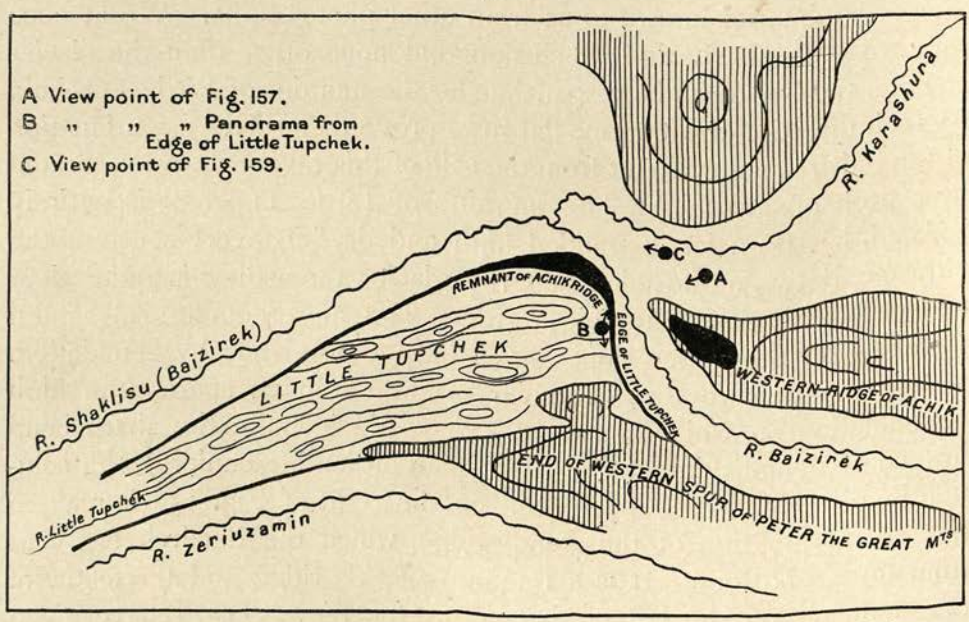
side of the deep Baizirek valley (see Figs. 137 and 158). The left one, on our side, is the end of the western ridge of Mount Achik. Between the two eminences a long, horizontal line is seen, the rim of the plateau of Little Tupchek. This we shall describe before going further. From the Karashura plain we descend about 400 feet to the powerful glacier torrent of the upper Shaklisu here called Baizirek. After fording it with great difficulty, we climb more than 800 feet over the steep slope of gritty rubble facing us in Fig. 156. Having reached the upper edge we find ourselves on a


WESTERN RIDGE OF ACHIK
EDGE OF LITTLE TUPCHEK
REMNANT OF ACHIK RIDGE
EDGE OF THE KARASHURA PLAIN (TUPCHEK)
PASTURE LAND OF TUPCHEK (KARASHURA)

157. Tracing explaining Fig. 156, being the view from A in Fig. 158.

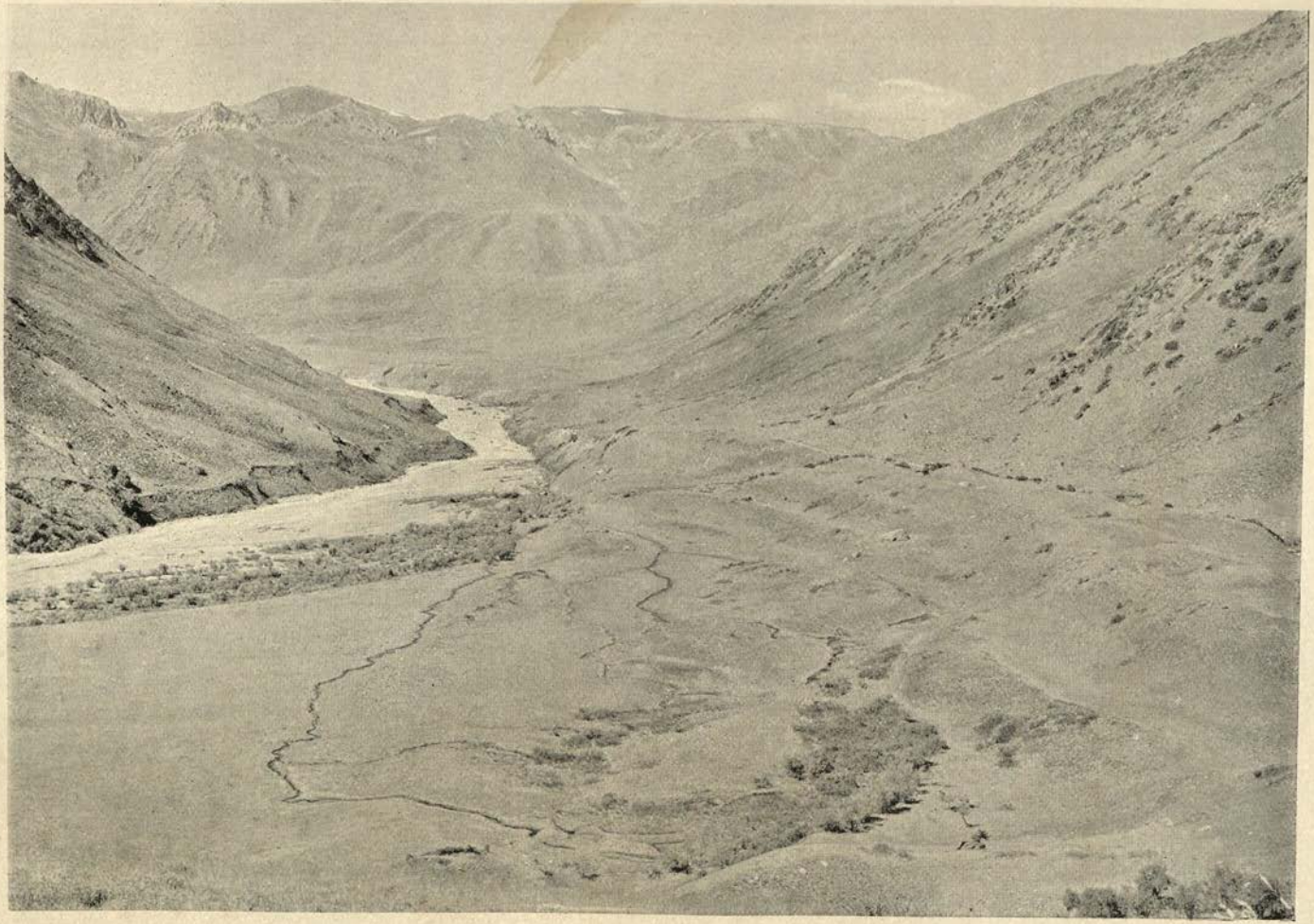
rolling prairie (cf. Fig. 160, our camp on Little Tupchek river, Chapter XIV), where several rows of morainic downs of great magnitude extend in a westerly direction, with a total length of about five miles. Save for a spring giving rise to the tiny brook of Little Tupchek, the plateau is very dry, having been cut off from all water supply and all energetic water action. The low hills on its northern side, a western spur of the mountains around Peter the Great glacier, can only provide a little water while the snow is melting. The higher, ice-covered summits of this ridge drain off into the Baizirek (Panorama,

accumulation in front of the snout, some change of current, such as we have observed on the Borolmas glacier, caused the stream to fall over the depression in the ridge. Probably there was a drop on the other side, so that it cannot have taken the river long to gnaw a cleft through the rock. Once this had been done, the new course was established and fixed for ever. However soft the material behind this point may be, the stream could no longer surmount it on its left, as soon as its highest water-mark had been lowered ever so slightly below the surface of the morainic plateau. Rivers can undercut and


A View point of Fig. 157.
B " " " Panorama from Edge of Little Tupchek.
C View point of Fig. 159.
R. Karashura
REMNANT OF ACHIK RIDGE
EDGE OF LITTLE TUPCHEK
LITTLE TUPCHEK
R. Shaklisu (Baizirek)
WESTERN RIDGE OF ACHIK
R. Baizirek
END OF WESTERN SPUR OF PETER THE GREAT MTS
R. Little Tupchek
R. Zeriuzamin

158. Sketch Map showing the Origin of the Moraines of Little Tupchek.

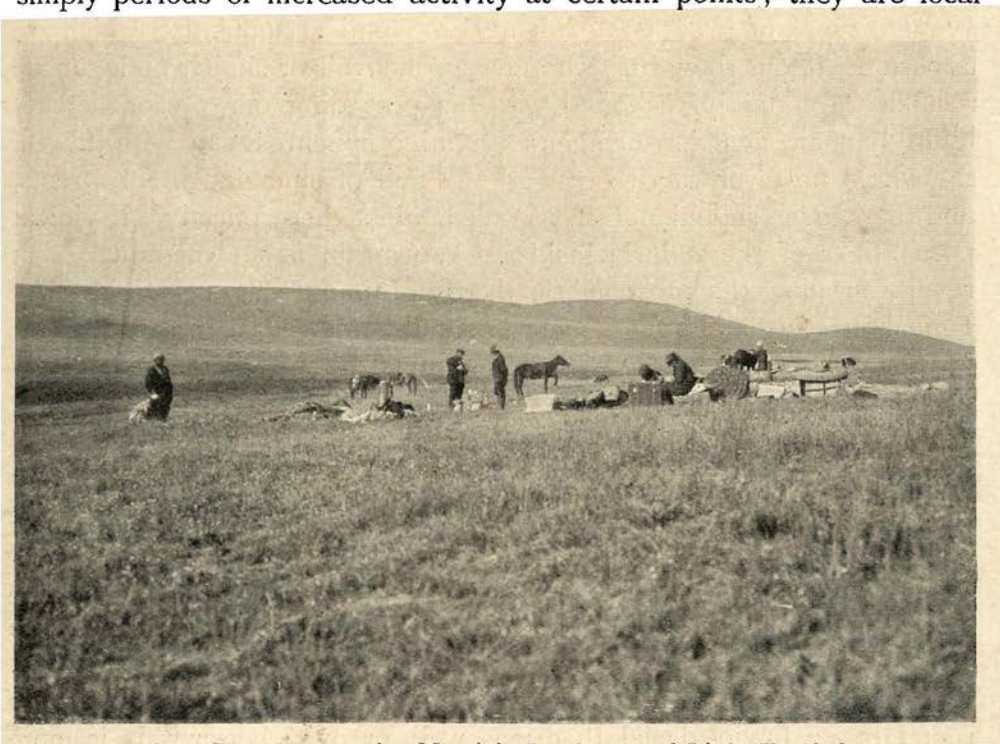
wash away loose stuff on their banks, but then they must be able to swing from side to side. Where two fixed points, such as gorges, projections and other hard places are near together, the river has no room to fetch a sufficient circle for the removal of all rubble from the rock slopes of the valley. By the curve of the Little Tupchek edge on the right of the panorama we can see that the Baizirek did swing a little into the material of the future platform, but further it could not go. It was irrevocably held fast by the notch in the ridge, and it may also be that the advance of the glacier during the Pakshif period took advantage of the gap, widening it sideways, whereas water



159. Looking down the Baizirek (Shaklisu) River.—Compare Fig. 158.

would be scientifically meaningless owing to the lack of an absolute of comparison.

Human thought moves pendulum wise between extremes. But as man and science get older, these swings are seen to be but the transversal amplitudes of one long inertia of uniform progression. From time to time a quickening may be observed due to the birth of new theories and new men. These are not reversions or deviations, but simply periods of increased activity at certain points; they are local



160. Camp among the Morainic Landscape of Little Tupchek.

changes in the relative grouping of energies, which do not affect the great tendency underlying the whole. Thus the catastrophes and reactions within the scientific system of mind pictures are the analogy of things themselves. Nature's doings are elaborate and complicated in our eyes, but just for this reason her occasional impulses are all the more radical.

With the word "catastrophe," brought forward as an example, we have really to do here. It is hardly ever mentioned in polite

East South West

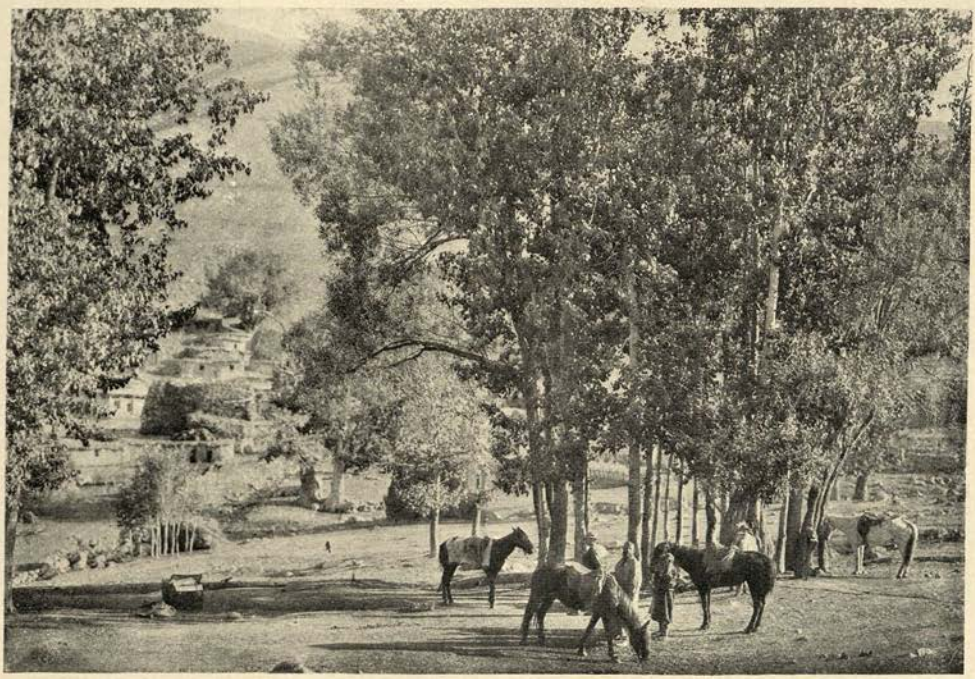
162. Panorama of the Glaciers of Peter the Great. Taken from a Point on the Southwest Ridge of Great Achik.

Karabura (Tyuchek) Gt Achik Ridge Baizhek Valley

163. Panorama from the Edge of Little Tyuchek; looking East.

163. The Battle of the Plants and Stones.—An old Mudspate on the Right.

are deep enough to make mountainous swells, the whole can be called a plateau, because the horseshoe rim falls away more deeply and more rapidly towards the outside than towards the inner basin. The broad backs and flanks of these massive hills, here and there tapestried with the yellow patterns of barley fields, produce as great an impression in their way as the wildest glacier scenery. To all intents and purposes Sagirdasht may be reckoned among the pamirs of the Duab. Rarely have I seen so regular a build of the watersheds dividing, as they do,

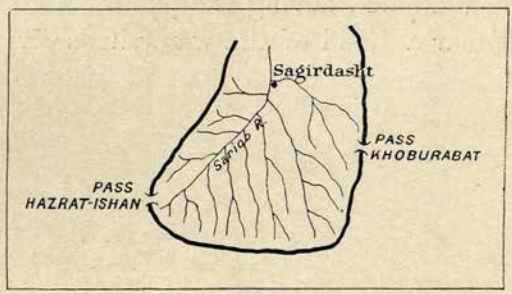


164. At Safed-Daron.

with almost theoretical precision attributable to the homogeneous structure and horizontal stratification of the conglomerate.

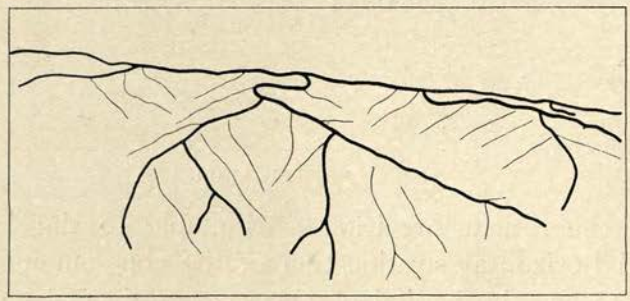
In order to see the capital of Darwaz we dived from the pass of Khoburabat into the ravine of the Khumbau river. In the hamlet of Khobu we found lunch prepared in a tent pitched upon the flat roof of a mill, so that we ate our repast to the homely rumble of the millstones underneath, revolved on the turbine principle by a race of darting water. Further down we saw the fresh mudspate channel of Fig. 167, traversing a cone delta corrugated by the bulges of older

tracks. The limpid pools of the Khumbau contained many fish, caught by the natives in baskets placed under little waterfalls. Seven hours after leaving Sagirdasht we found ourselves gazing upon the mighty flow of the Panj or upper Oxus. Kalaikhumb is laid out on a triangular terrace sketched by a bend of the Panj. It is not larger than a moderate village of the plains, thus illustrating the poverty of the mountainous



165. The Sagirdasht pamir.

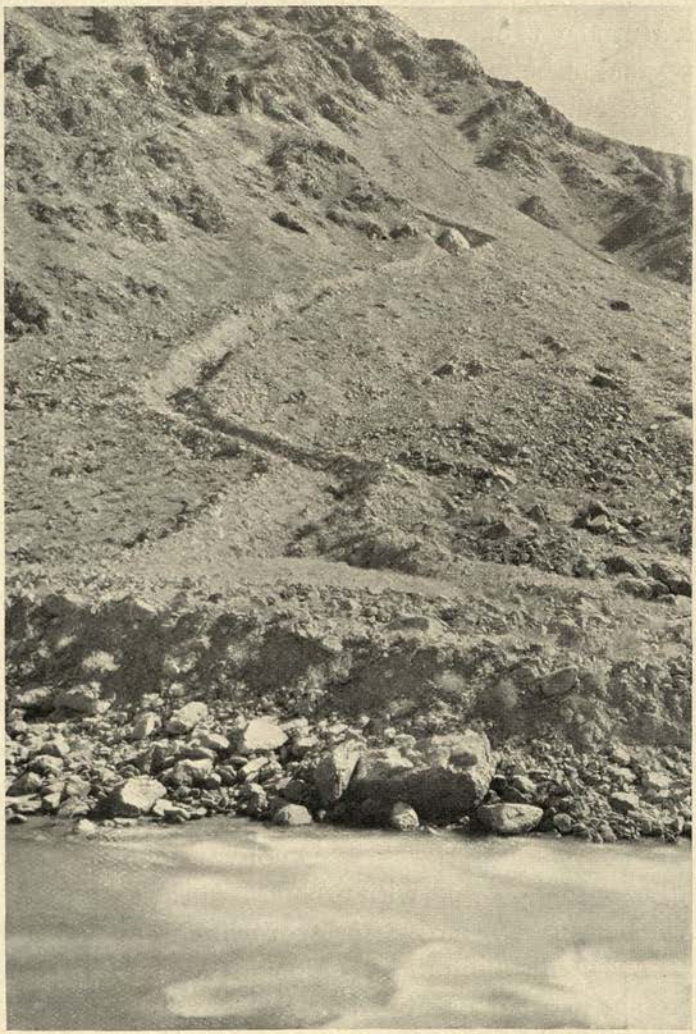
province of Darwaz, furthermore revealed during a short excursion down the river. As a whole the valley presents a cheerless sight with its black slate rocks and arid scree slopes. Only here and there a cluster of trees shows where frugal peasants manage to wrest a pittance from the unwilling desert of stone. Enormous moles of rubble amassed on the borders of the fields (Fig. 169) testify to the



166. Ridge Dichotomy.

rarity of soil. Famine is a constant visitor to these parts where dried mulberry is a common substitute for bread, and even the pith of asafoetida is frequently eaten. At this time of year a pleasant feast is offered to the eye by the gleam of scarlet pods of peppercorn hung out to dry in rows and bundles.

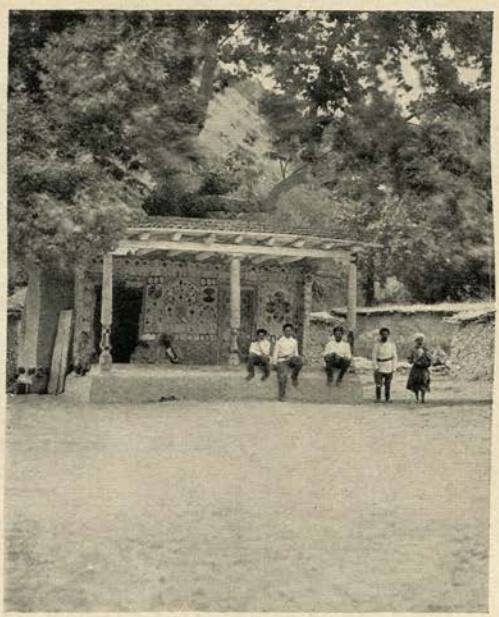
The Afghan side presents nothing of special interest, unless it be the marching up and relief of the frontier posts at certain hours of the day. We paid our usual homage to the Beg and there met



167. Mudspate Track in the Khumbau Valley.

Baron Anatol Cherkasov of the Political Agency and now Russian consul at Julfa. He had just returned from a journey of inspection through Shugnan and Roshan, the Pamir provinces of the Khanate. Among other interesting things he told us of a sect calling themselves

Panj Tengi, and which he believes to have something to do with the Ismaelians. What with Kafirs, Iranians, Jusufzai, Galchas and others, the ranges of Pamir seem to hold within their icy embrace many a secret of human origins. According to v. Schultz the Pamir Tajiks are mostly Murudic Mùhammadans. Their priests are called ishans and are supposed to be descendants of Ali. The head of the sect, the Aga Khan, lives at Bombay. The oldest portions of the citadel of Kalaikhumb at once recalled memories of Julius Caesar who, not content with scourging the Gauls, has laid a curse upon untold generations of schoolboys. His description of the Gallic walls seems to fit the construction of the old fortresses of Darwaz, built of alternating layers of beams and stones. Schwarz even assumes a direct ethnological connection. The only tower left standing is provided with those jutting, nose-like loopholes (machicolations) used for throwing stones or pouring molten lead and pitch upon the beleaguerers. They are the first of their kind I have noticed in the East. The courtyard (Fig. 170) is of the conventional order with its tank and square flower bed planted with aromatic herbs.

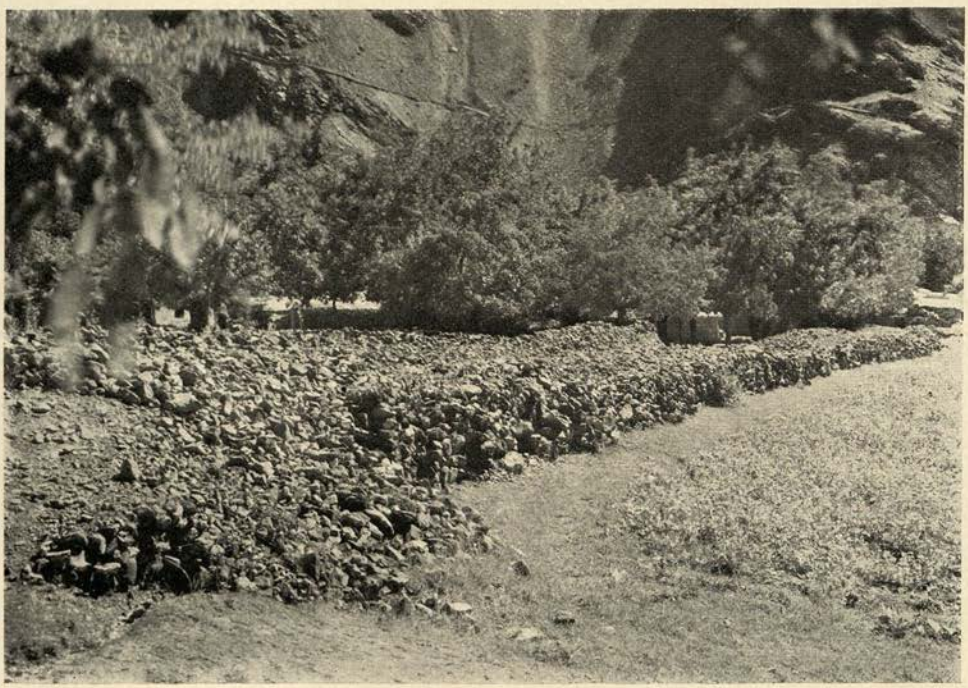


168. The Guard at Kalaikhumb.

The town boasts of a native garrison which entertains the citizens with martial music and military evolutions every morning and evening. Their appearance in a garb that strives to imitate Russian uniform has something of the ludicrous about it, being one of the many examples of perversion of taste which contact with Western civilisation so often produces in the Oriental. The barracks of the force consist of several rows of low mud huts. What makes them remarkable is the way in which they have been embellished by the tender art of gardening. Gay flower-beds fill every space, the walls are hidden under rambling

leafage and rich garlands of bindweed are made to trail over lattices and arbours. It seems that soldiers are the only ones in this country who practise this effeminate cultivation for the sake of beauty alone (compare also Fig. 187) probably because they feel time weighing heavily upon their hands. Theirs at any rate are the only gardens conforming to our idea, and one must admit that charming results are obtained by simple means.

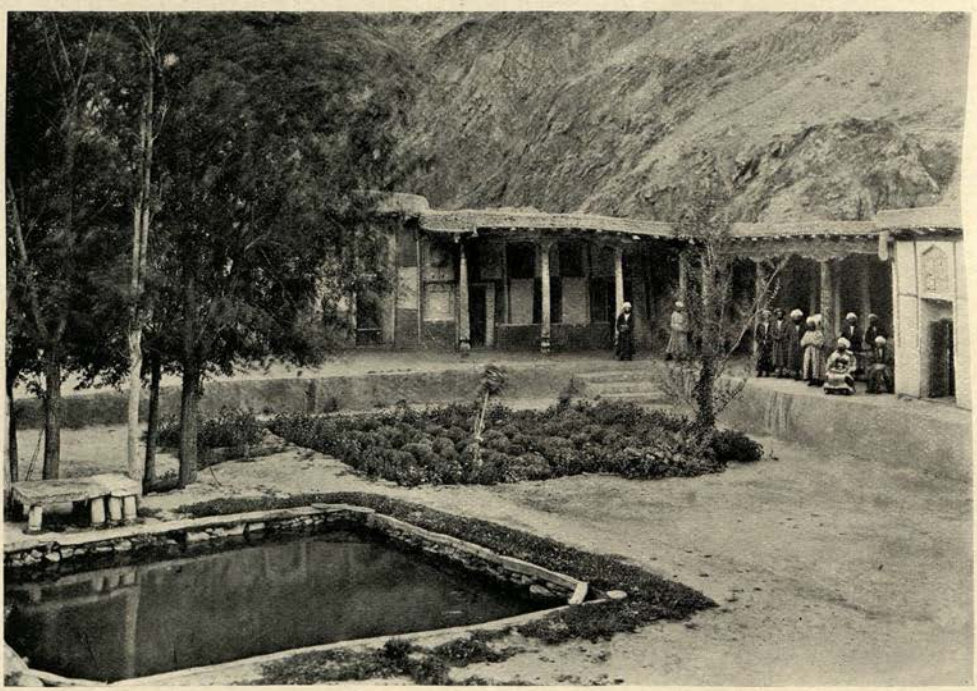
Returning to Sagirdasht on September 24, we passed on to the



169. Stones for Bread; on the Fields near Kalaikhumb.

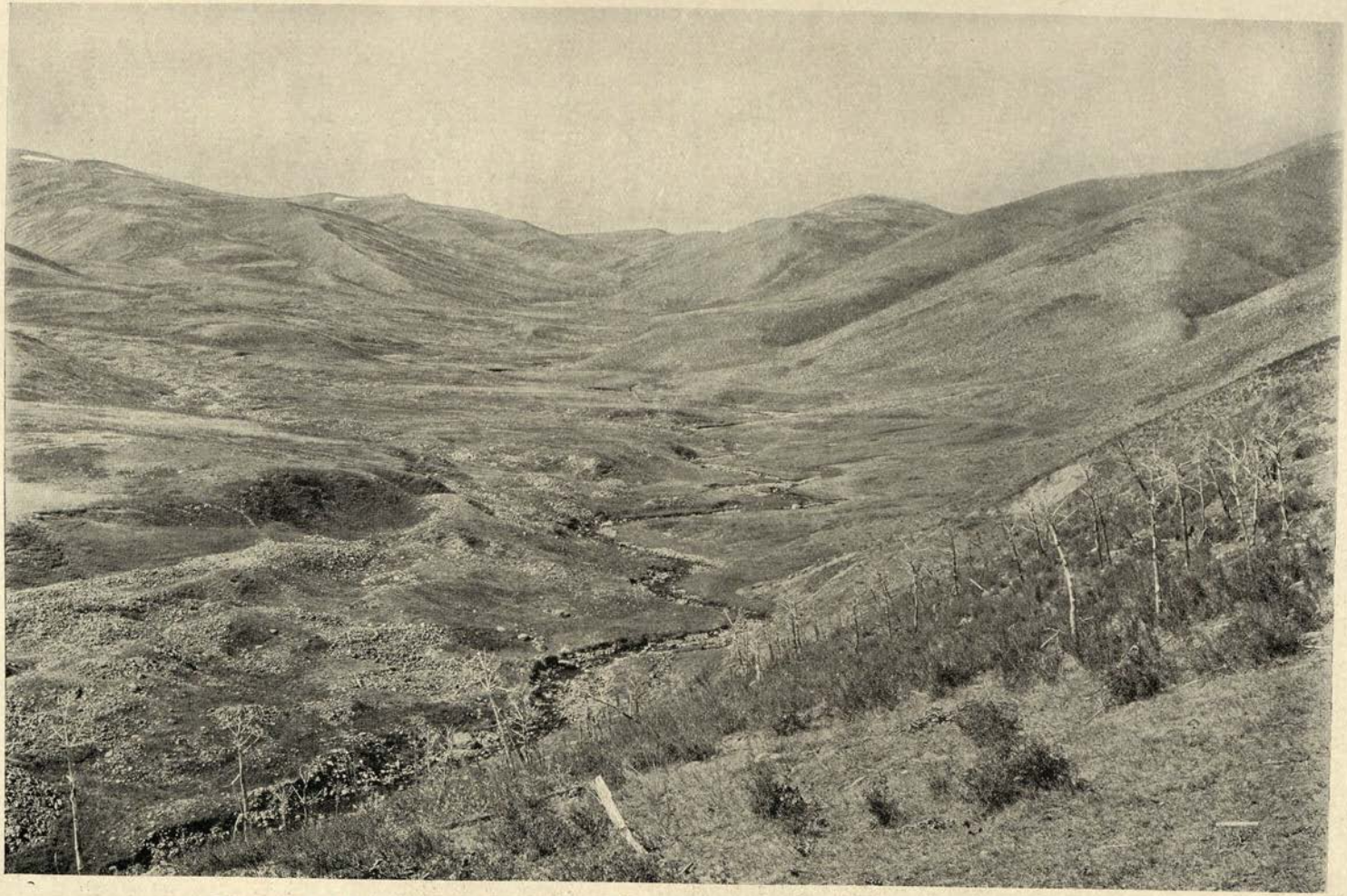
valley of the Yakhsu. On nearing the Hazrat-ishan pass (Fig. 165) the traveller finds himself in a typical pamir landscape of great width and sweeping magnitude of line (Fig. 171). Might this not almost be a northern moorland scene with the brook meandering in its peaty track? The tallest vegetation is represented by the withered candelabra of asafoetida. Along the ridges we see perfect examples of the hollowed halfmoon markings caused by snow pressure (cf. also Figs. 155, 174), the embryonic stages of corries or glacial cirques. After crossing an

intermediate valley and another pass we entered the Yakhsu valley at its upper end. Here we were in the midst of the great conglomerate region. Everywhere the openings of side valleys offer new peeps into one of the quaintest mountain formations of the world. Earlier travellers have never mentioned these sights, hence I may assume to be the discoverer of the Yakhsu Conglomerates when I first visited them in 1896. Their shapes betray much similarity to those of Colorado and the Bad Lands. This clearly stratified mass, to which



170. The Palace Yard at Kalaikhumb.

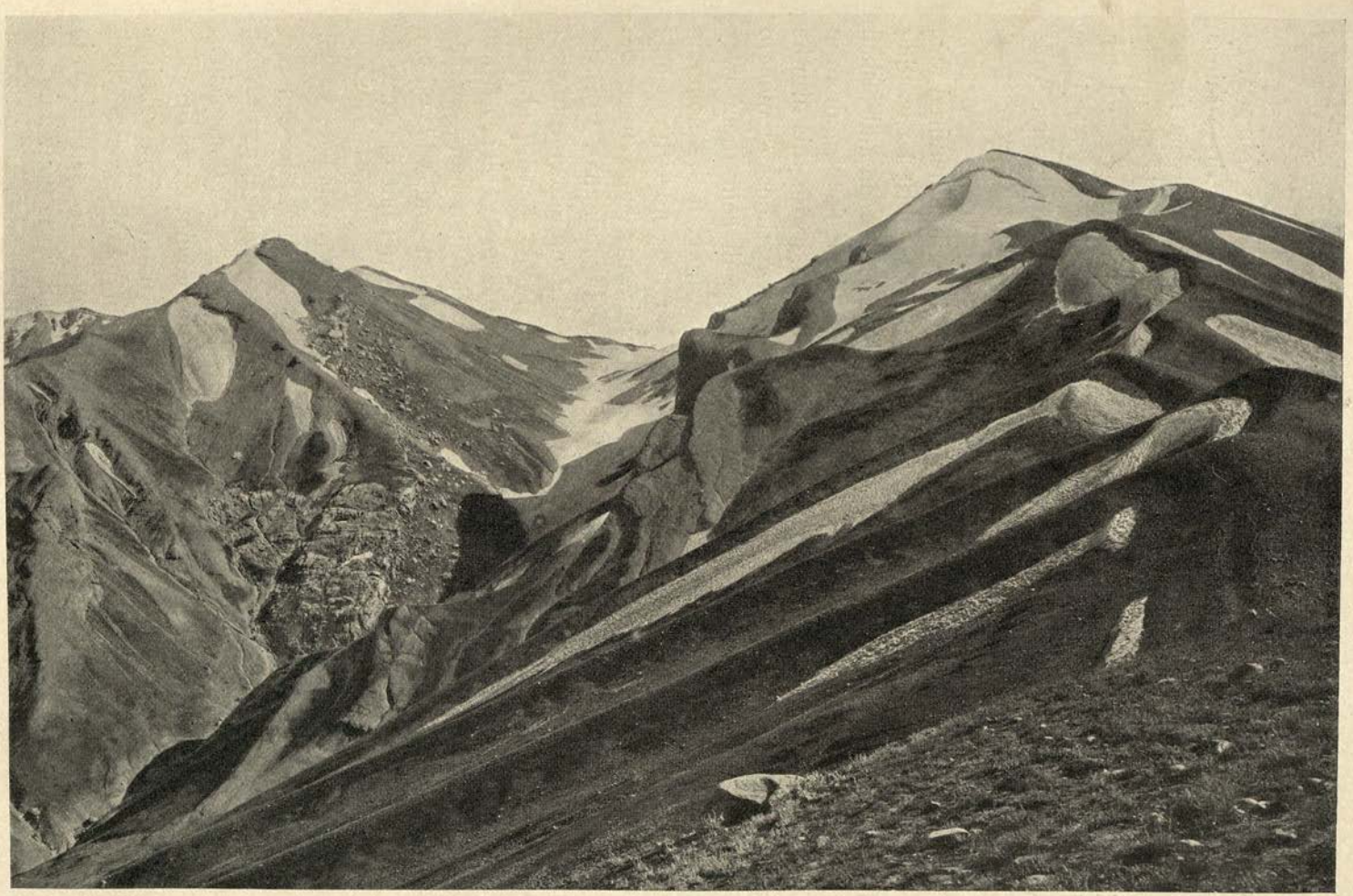
Krafft ascribes an early tertiary age, covers (as far as known) a surface of 400 square miles disposed in a strip between the rivers Vaksh and Panj. The vast accumulation of water-worn pebbles attains a thickness of many thousands of feet enabling some of the peaks to top the snow-line. As can be gathered from our photographs, the deposit has been broken up by later upheavals in spite of which some of the blocks or sections have remained in their original, undisturbed position, as shown by the perfectly horizontal bands of the layers. Fig. 172 shows a tilted



171. Nearing the Hazrat-ishan Pass. A Valley of the Pamir Type.—Asafoetida Stalks on the Right.

172. Tilted Conglomerates on the Yakhsu near Talbar.

173. The Surging Rocks. Yakhsu Conglomerates.



174. Hazrat-ishan.

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miners being guided by the sound of running water. In this manner the hidden conduits grow section by section. Some of them are over a mile long and all of them form a system of complicated ramifications known only to the old hands.

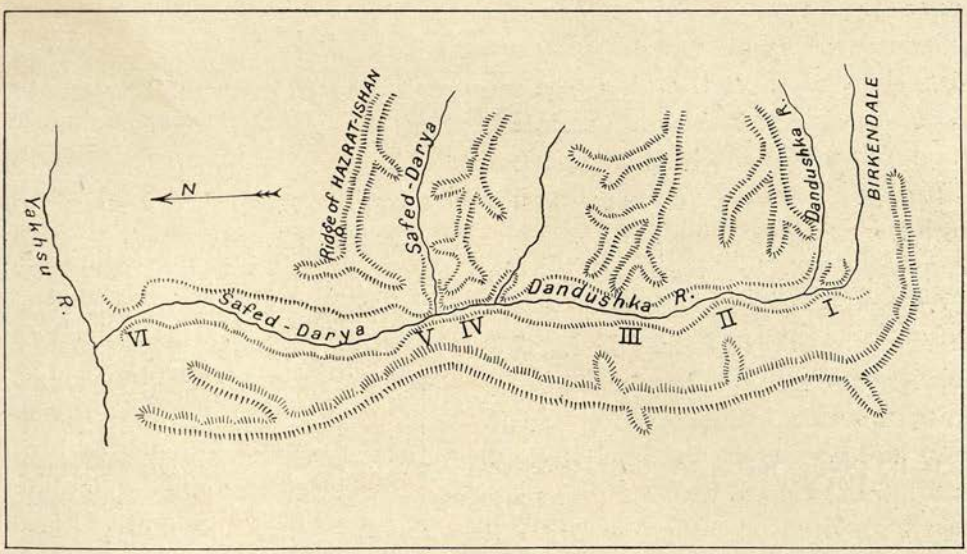
The native method of mining is extremely dangerous, for sometimes a gallery will collapse without warning and many lives be lost in this way. Some Western plant of gold mining machinery should prove highly successful on the Yakhsu and its tributaries. The distribution

175. Barrier at the Junction of Dandushka and Safed-darya.

of the metal is so safely assured that one can calculate to a nicety the contents of every claim, and if by now my own claim has not been jumped, even a poor scrivener like myself owns a million pounds between his boundary posts. The snow-fields and glaciers of Hazrat-ishan ensure a liberal and regular supply of water, the climate is healthy and allows of at least 300 working days in the year, the approaches are not too difficult, labourers are plentiful and provisions are easily obtainable from the thriving centres of Baljuan or Kuliab.

On the Zarafshan and at Little Tupchek we have already observed

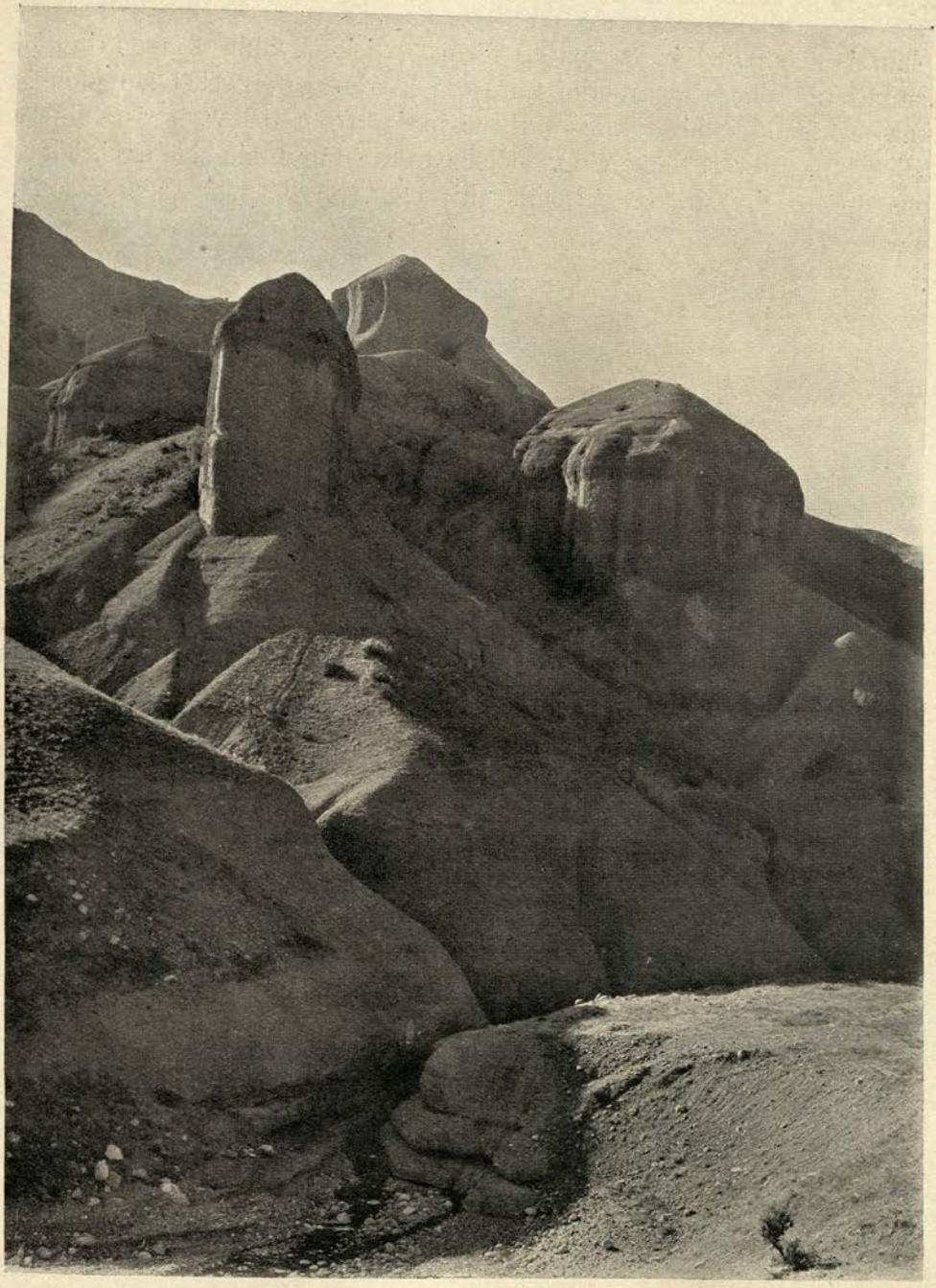
the phenomenon of passages eroded on the principle of the superimposed or inherited valley. Here we find them again, but multiplied in a remarkable manner, and represented by a row of barriers of diluvial detritus, combined with a gate of solid rock. This series of obstructions cannot fail to excite the curiosity of any one wandering along the combined Safed-darya and Dandushka valleys. The stream has pierced them all, but the geographer must tediously scramble over their flanks of cemented grit. A full view of barrier IV from the north is presented by Fig. 175. The Safed-darya river is coming



176. Plan of Dandushka Valley with Barriers.

from the left to join the Dandushka issuing from its canyon on the right. Fig. 179 shows barrier III from the south.

An idea of the topography may be formed by a glance at the plan of Fig. 176. Running from south to north there is the long and narrow valley. The upper reach belongs to the Dandushka, the lower half being claimed by the main river, the Safed-darya, tributary to the Yakhsu. For the sake of convenience I mean the entire straight line of combined valley sections when speaking of the Dandushka. The total length of this ditch is 10 miles, the height above sea-level being about 5300 feet at the lower and 7000 feet at the upper end. The gradient is 3 per cent. and very even; water is discharged into the



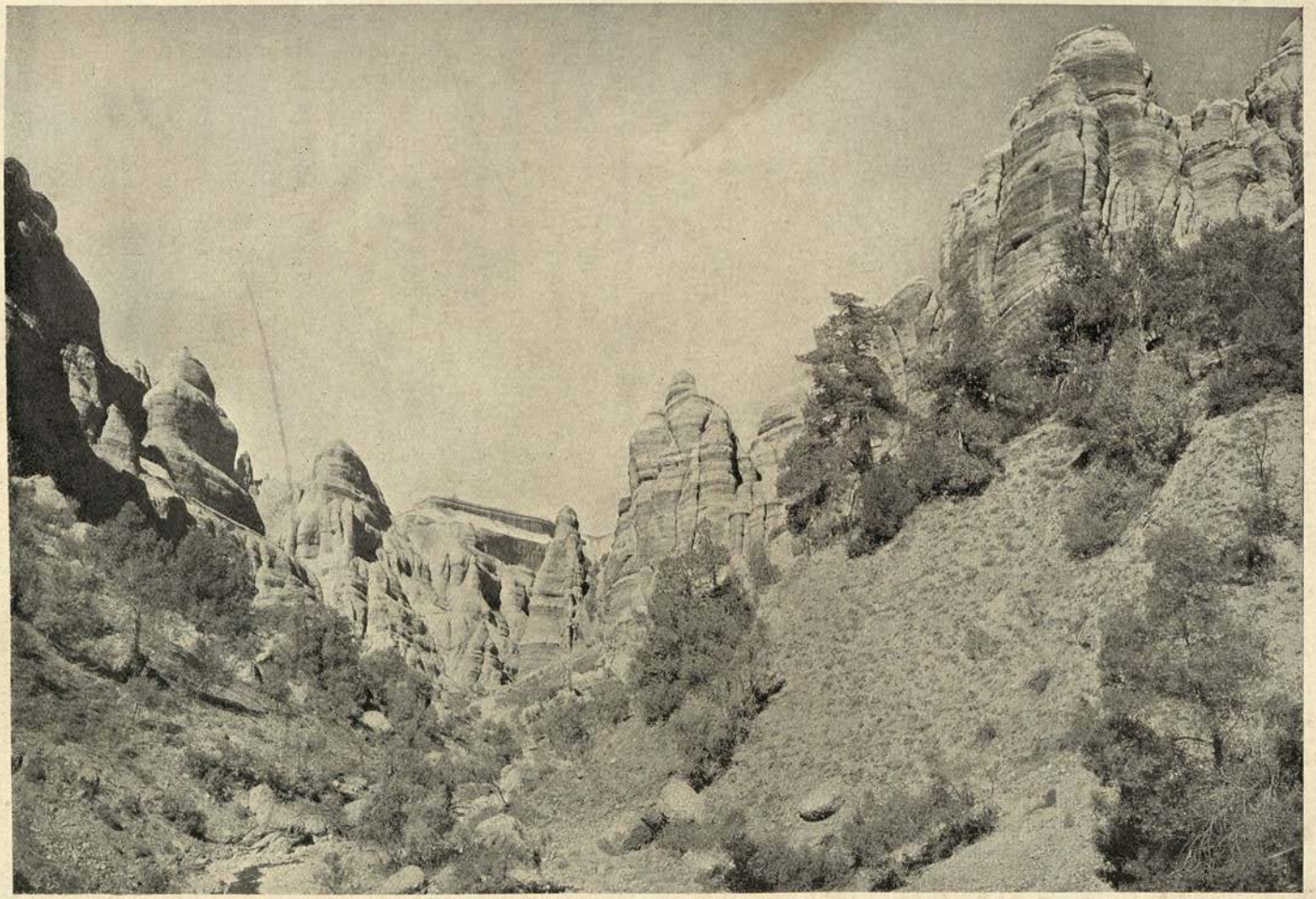
179. At one of the Upper Barriers of the Dandushka.

plain is narrowed in, so as to form partitions, akin to a string of sausages. These contractions are the barriers. No. III is a double bar. If one examines one of these jetties from below, it rises like a solid dam athwart the ravine. Close to the mountain side a slit gives passage to the stream. Inside this cleft, on both sides, are blank,

180. Birkendale.

smooth walls of solid conglomerate, and the same material is discovered below the water after the litter of superficial rubble has been cleared away. The average height of the barriers is 50 feet. No. I measures about 30 feet, while the uppermost terrace of V is over 100 feet above the water. The width of these dikes likewise increases as one goes downstream, the canyon also broadening in proportion to the growing

181. Row upon Row of Sculptured Conglomerate.—Barley Fields framed in Scrub; Yughan Plants in Foreground.



182. The "Indian Temples" in the Dandushka Valley.

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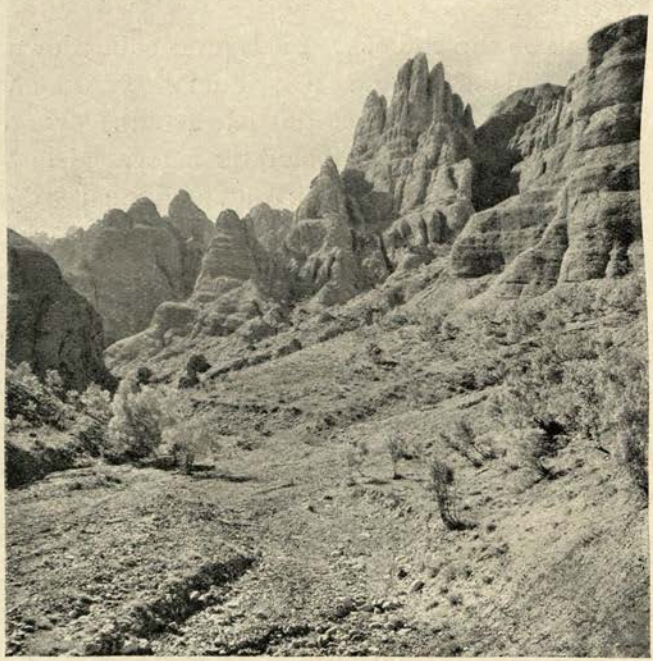
fortunately stopped by the Russian authorities, and now the walnut is strictly preserved.

At Dagana we emerged into the broad plain of the lower Yakhsu, which here traverses a basin three to four miles wide, bordered by a line of bluffs. It was now getting very cold, and a frosty mist chilled us in the mornings. A night was spent at Kuliab, which offers nothing of special interest. In the bazar we bought magnificent, juicy grapes at a halfpenny a pound and a pheasant for a penny. After Kuliab



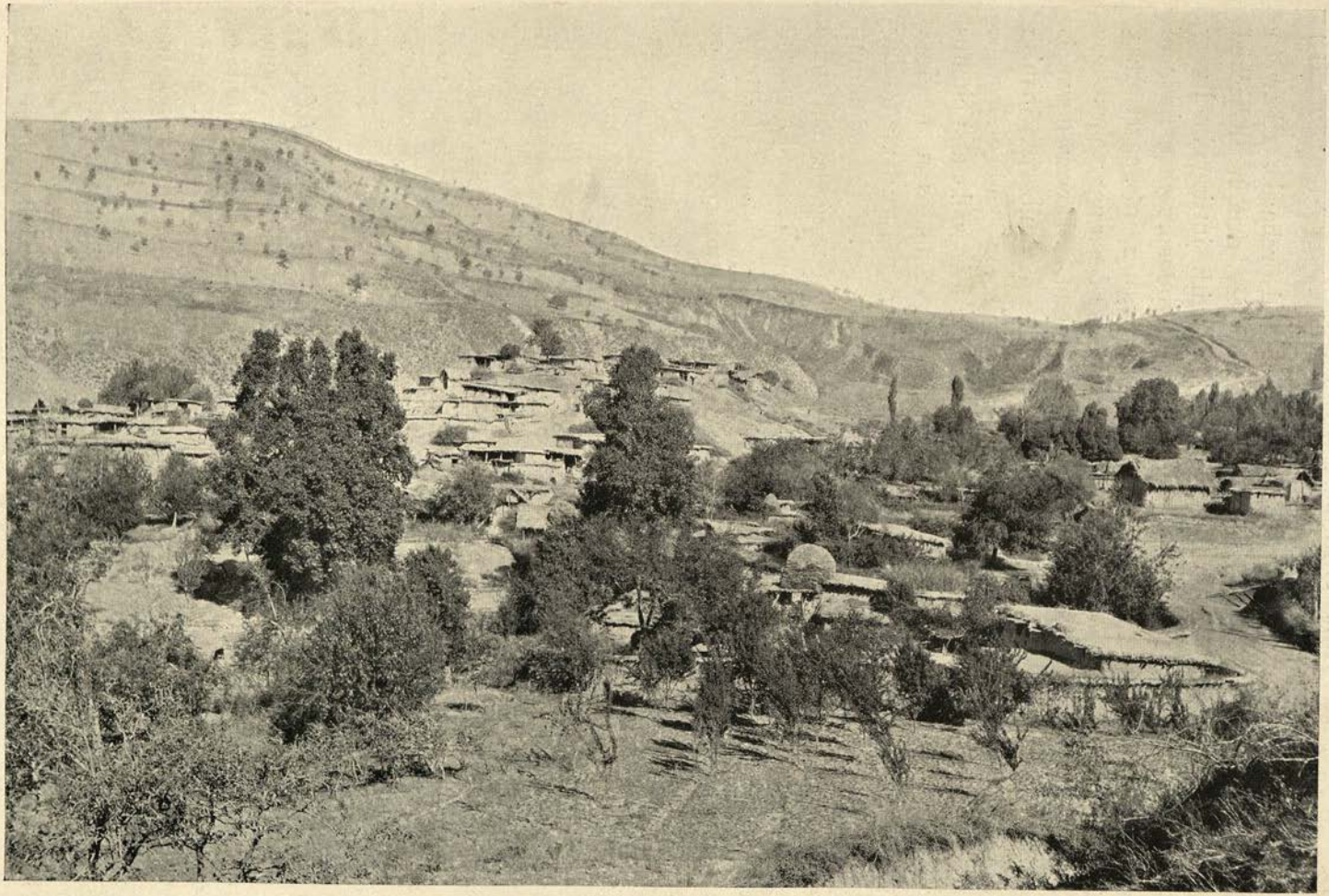
183. Towers of Silence at the Entrance to Birkendale.

the prospect widens still more, presenting the familiar expanse of rice squares, interspersed with fens and reed-beds. On the edge of the cliffs fringing the road sat numerous birds of prey of all kinds and sizes. Like watchful sentinels they conned the fields, for owing to the mist they could not see anything when circling in the heavens. At Chubek we entered the beaches of the Amu-darya, and at Sayat touched the bank of the great river itself, here divided into two equal branches looped around the island of Urta-tugai, a wilderness

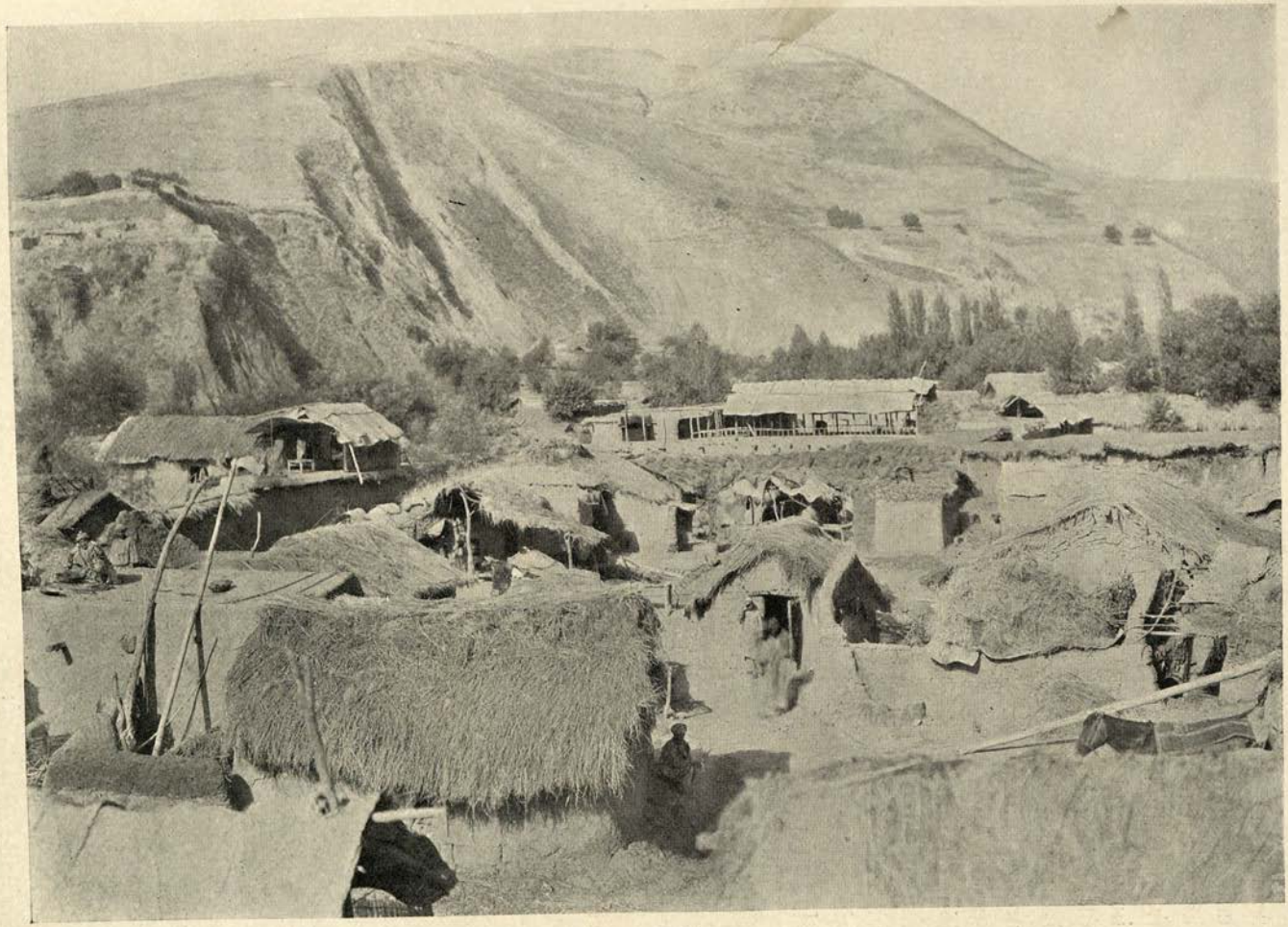
of swamp and jungle, full of waterfowl, pheasant, boar, deer, and tigers. Following the right arm we finally reached Parkhar, where we spent many delightful days roaming and hunting. The landscape is real jungle, although, true to the qualities of the climate, the vegetation is not impenetrable on dry ground, water and quagmires forming the only bars to progress. To our regret the want of boats prevented us from landing on the island of Urta-tugai.

184. The House and the Haystack (Yakhsu).

The whole is a maze of steppe, bush, marshes, and channels. The plots of dry savanna form gay parks studded with coppices, rambling trees, clumps of plumed giant grass and pink tamarisks, in between which spreads a beaten floor of ruddy clay. Elsewhere are thorny forests, just high enough to weave a shady canopy over one's head. Alternating with these insets of higher ground are morasses, beds of



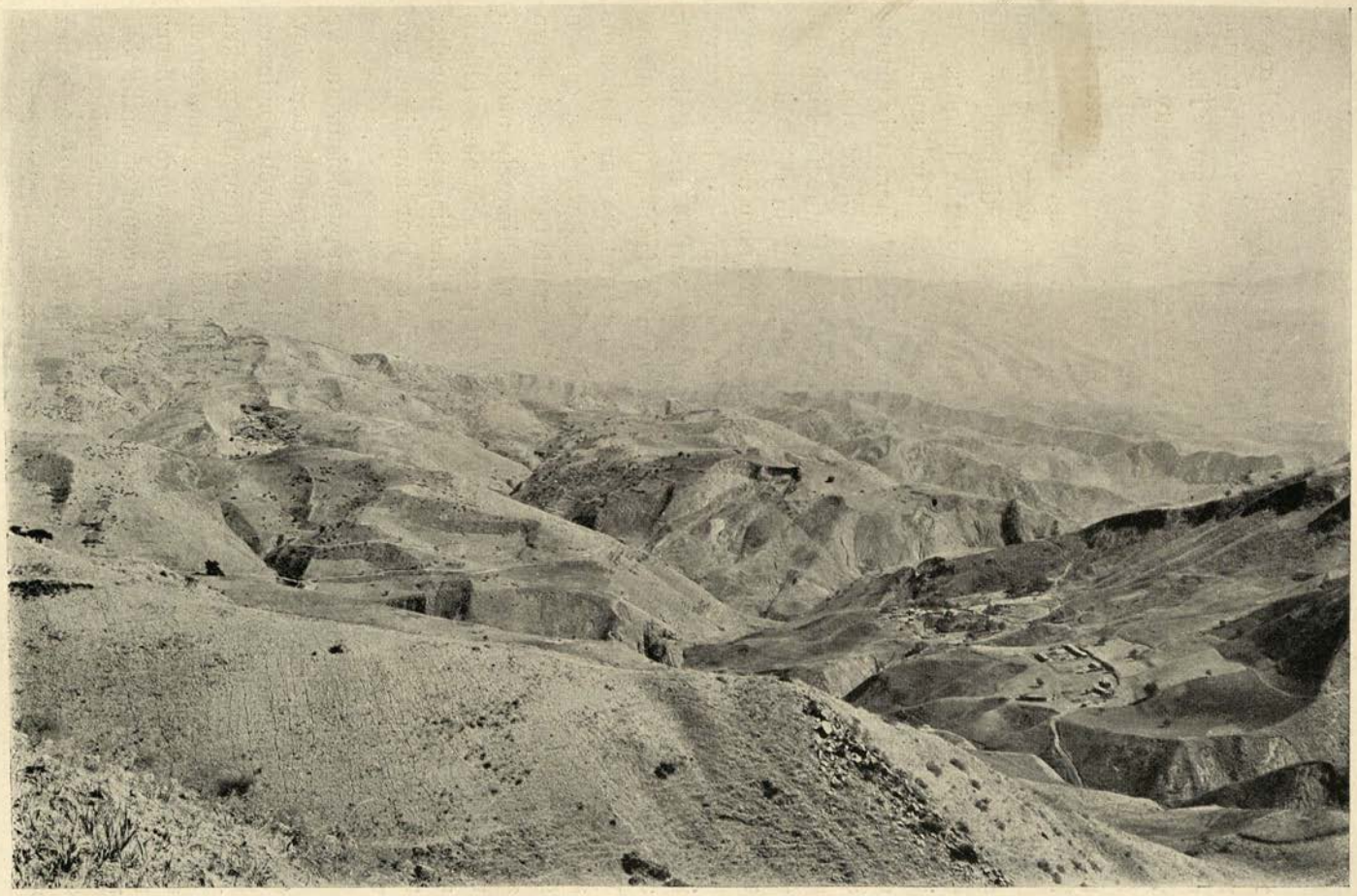
185. A Village in the Hills near Muminabad.



186. Baljuan.

187. A Soldier's Home at Baljuan.

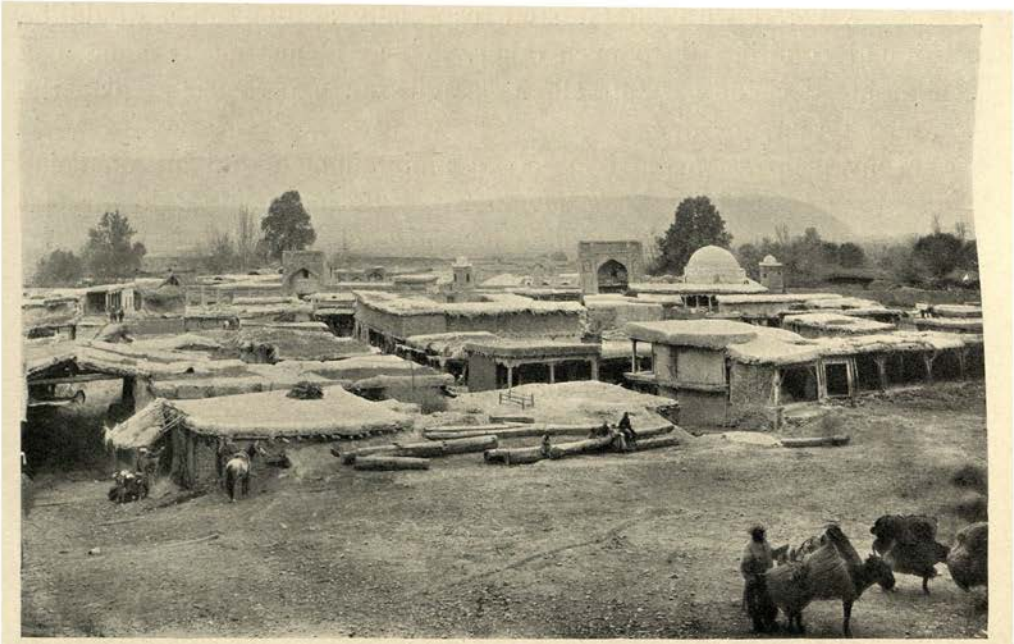
188. A Village in the Loess Hills near Karayar.



189. On the Zardoliu Pass. A Hazy Steppe of Loess Hills.

190. Looking up the River from the Edge of the Loess Cliffs at Diushambe.

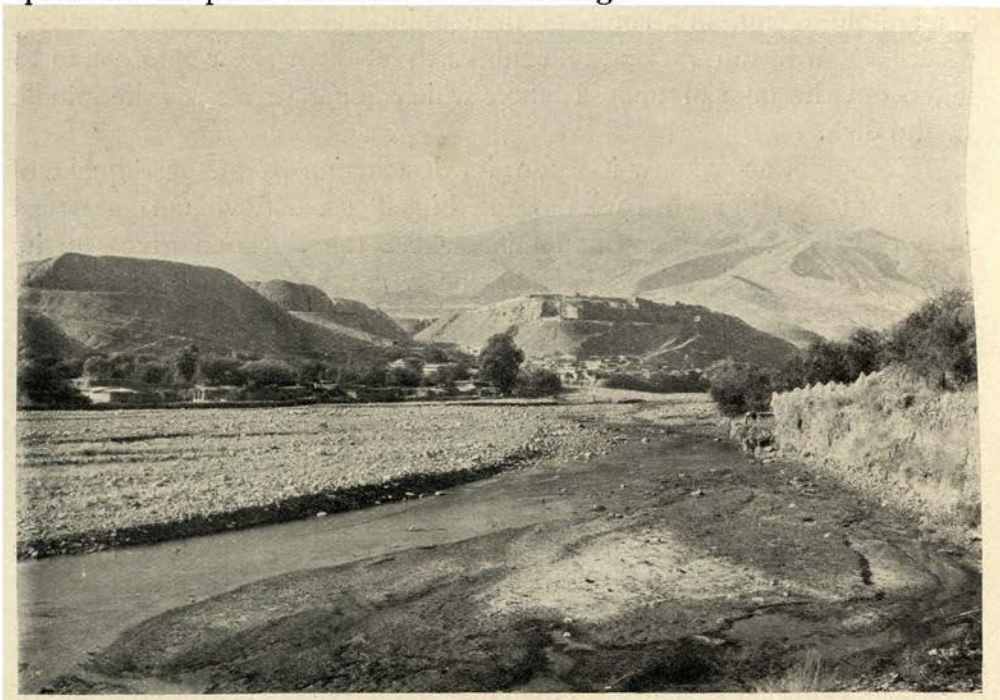
the Kirghiz. In the evening he introduced his spouse to my wife in whose words the visit is reported. She is a Tatar and quite a beauty of her type, with fine features and smooth skin, satinlike in its softness. The eyes are of the peculiar shape which distinguishes all the Mongol races. She was magnificently arrayed in a long khalat of cloth of gold. Her head dress was most becoming and bore semblance to the headgear of the priests of the Greek church, with the difference that in her case a veil of rich, dark blue, shot silk fell from it in graceful folds over her shoulders. Her feet were bare; on her wrists she wore thick silver



191. Hissar.

bracelets. The other women of the establishment, about five in number, were similarly clad, but in simple material. The special duenna of Rakhmetullah's pretty wife was a somewhat elderly crone whose thickly painted eyebrows gave her quite a fierce appearance. We all sat on the floor, which was comfortably carpeted, and drank tea. Rakhmetullah then opened a bottle of wine and made me drink friendship with his wife. Our conversation was carried on through the medium of Russian, my scanty knowledge of which just served for the stringing together of a few simple questions and answers. Before

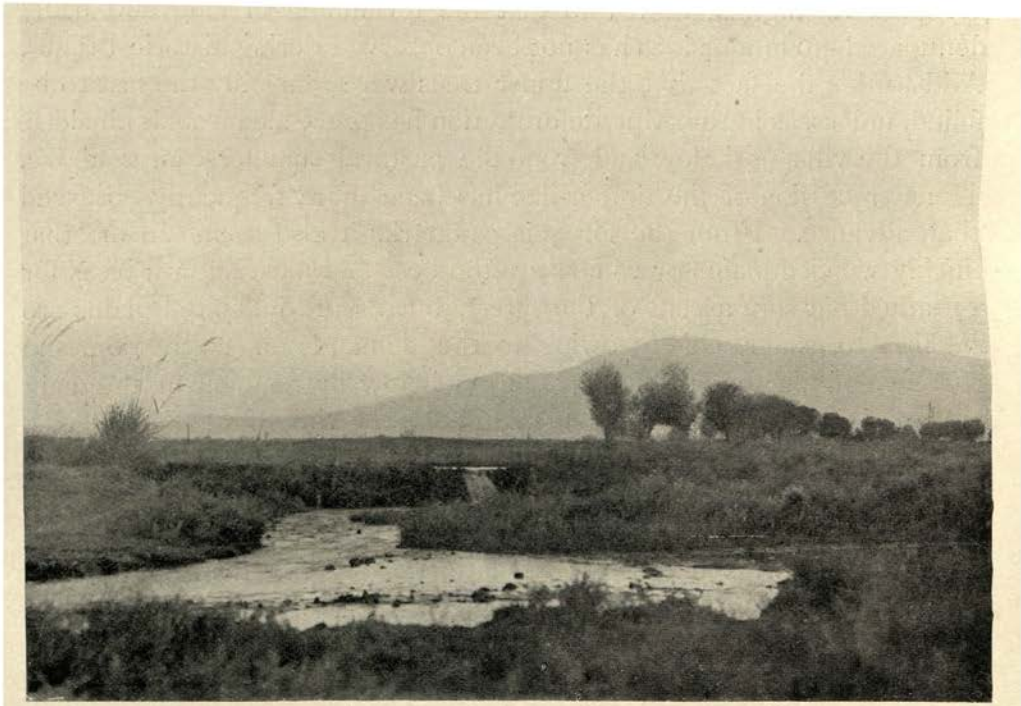
was put over the whole of the eastern and southern provinces receiving the highest title the Amir could bestow. We still knew the old man Astanakul who was a fine type of the Oriental nobleman with his high-bred courtesy of manner. He died a few months before our last visit and was now succeeded by his son, a rather bloated and uninteresting personage. In winter he resides at Hissar, leaving it behind in summer as a mere concept of supremacy and an assembly of empty houses. Almost the entire population follows him to change miasma and mosquitos for the purer mountain air of Karatagh.



192. Karatagh before the Earthquake.

The moving of the Lord Lieutenant is no small matter settled by the ordering of a furniture van. It is more like the progress of a travelling circus, though probably more interesting. An army of camels, horses and donkeys is levied. In endless succession they transport the paraphernalia of government and household, and everything connected with them. Nothing is left behind that is necessary for the acts of state or the pomp and circumstance of a dignified court. Everybody follows who claims a position in society

Owing to the scarcity of the population I do not think that the quantity of trees in the Duab has been greatly reduced during historical times, especially in view of the fact that loess is not a timber soil. True forests only thrive in the mould of moister regions, and in these the progress of spontaneous afforestation is proportional to the rapidity and exuberance of plant life. Painfully slow and ever struggling in the Alps, the growth of forests is irrepressible in the tropics where the smoothest rock is covered with rank profusion, where man has to

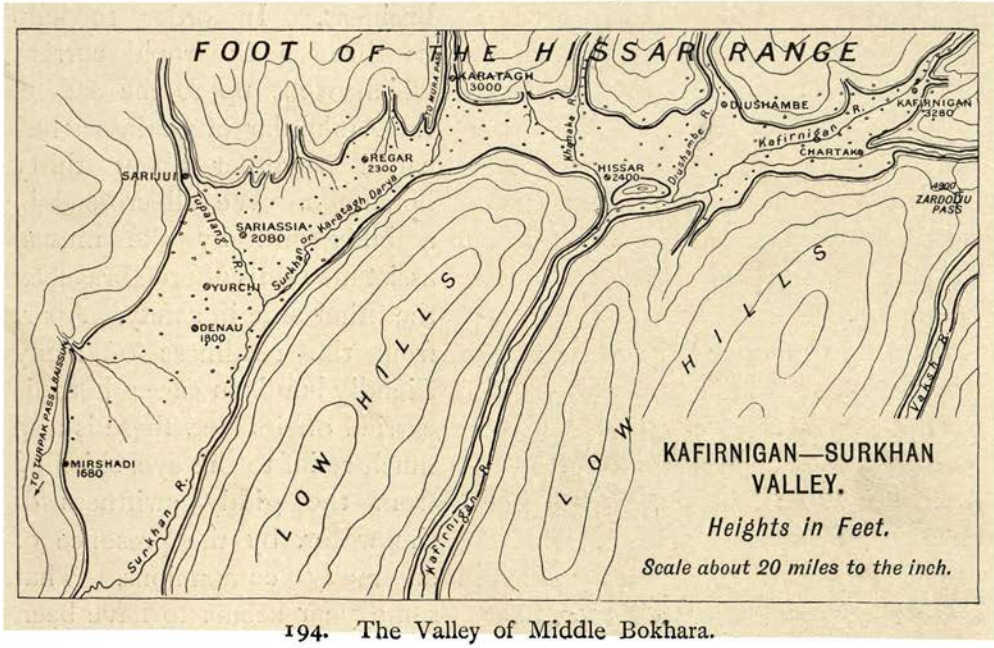


193. A Watery Plain near Sariassia.

defend himself against the jungle and where a defeat of vegetation is practically unknown.

Beyond Hakimi the road becomes execrable, being turned into a rack studded with sharp stones and boulders. The landscape is one of arid limestone peaks relieved by groves of very fine walnuts and elms. These mountains can best be compared to those of the Julian Alps, but being higher here they send forth larger rivers from their névés and glaciers, so that many valleys of Carniola are even drier

than those of the Hissar province. Not a single bite of grass has been left along the path, and near camping places some damage has been done to trees by searchers for fire-wood. Near the top of the pass a herd of ibex scurried across a slope quite close to us, but before we had become aware of their presence it was too late, even for a flying shot. Large birds of all sorts continually circled above our heads and Albert dropped two lämmergeiers on the wing with the Mannlicher rifle. Arrived at our goal we found the view restricted and nothing much to interest us, unless it were the aspect of snow-fields closely



194. The Valley of Middle Bokhara.

furrowed with grooves one foot deep. Returning to Karatagh we resumed our homeward tack along the great caravan route.

As far as Denau (cf. Fig. 194) we amble through a rich, irrigated country, now mostly dry, to which tufts of steppe grass and isolated trees sometimes give the appearance of a savanna (Fig. 193). I have seen it at all seasons, oozing with sultry moisture and ringing with the hardness of a morning frost. Save for the flies which still bother the horses, the life of insects and lower animals is quite extinct; dead sheltopusiks and the empty shells of tortoises are here and there seen lying by the roadside. At Yurchi we found the forsaken remains

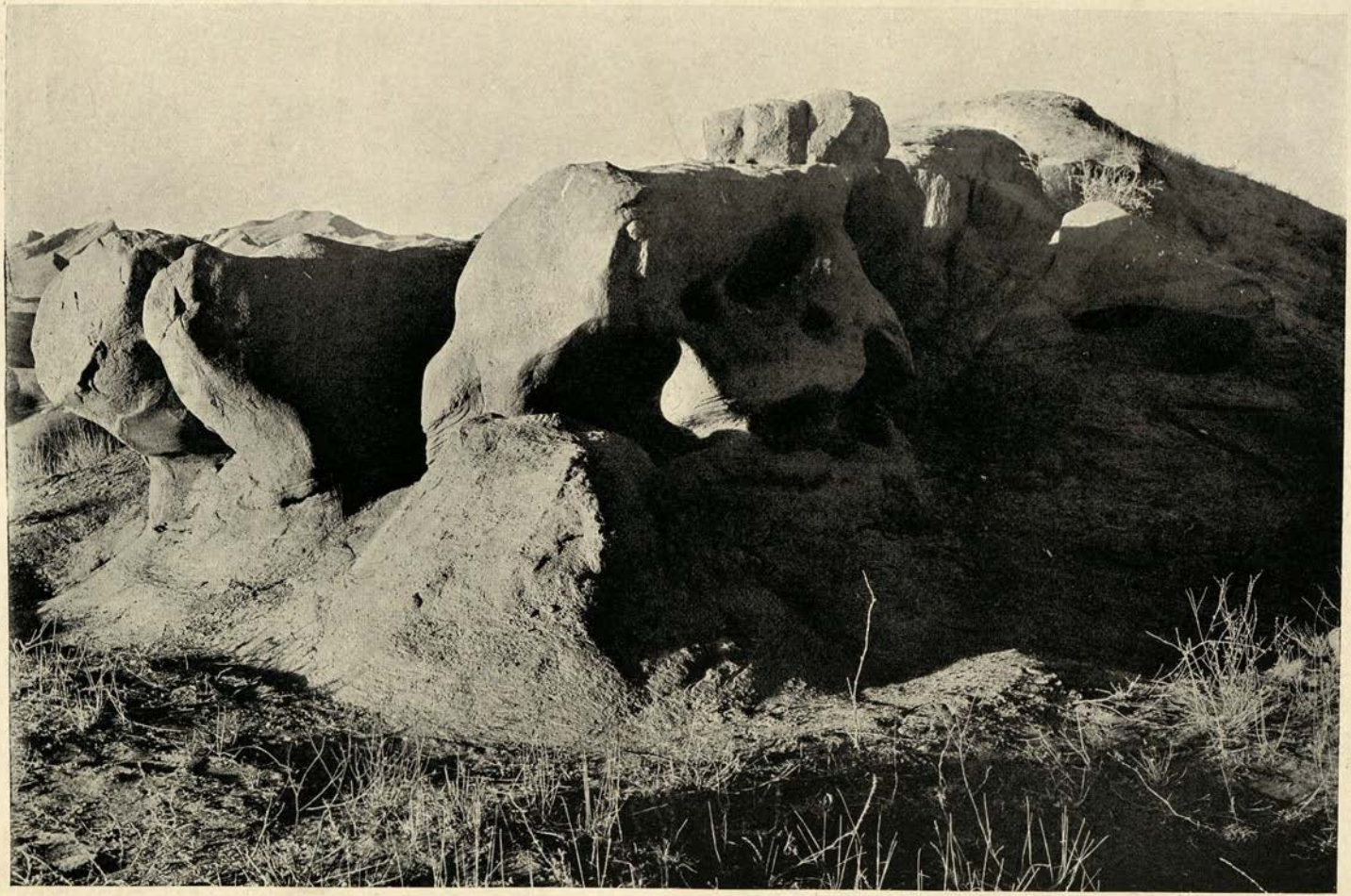
of a mud-fortress returning to the common soil from which it had once so proudly risen. Only a thick, brick-built tower of Babylonian shape promises to hold out some time yet, offering a welcome building site meanwhile to several families of storks. The spreading nests have protected from erosion parts of the rim underneath, thus producing a kind of short earth pillar with the nest as covering stone. When I passed through this country in 1896 there had been a great flood of the Tupalang river destroying much life and property. As all the bridges had been swept away, fording the turbulent stream was a serious business. In order to help us through the rapid current which went up to the saddle, the Amlakdar of Sariassia had called together about thirty horsemen. We all crossed in a body and by the mutual assistance thus afforded reached the other side in safety. Apart from the readiness of many friendly hands in case a horse is carried off its feet, there is also much relief to the eye, shielded from the giddy swiftness of the water, by the presence of so many companions. That same year seems to have been more than ordinarily blessed with floods, for I remember that on my way from the Caspian to Bokhara the railway was interrupted by the Tejen river.

195. Giant Grass (*Lasiagrostis splendens*).

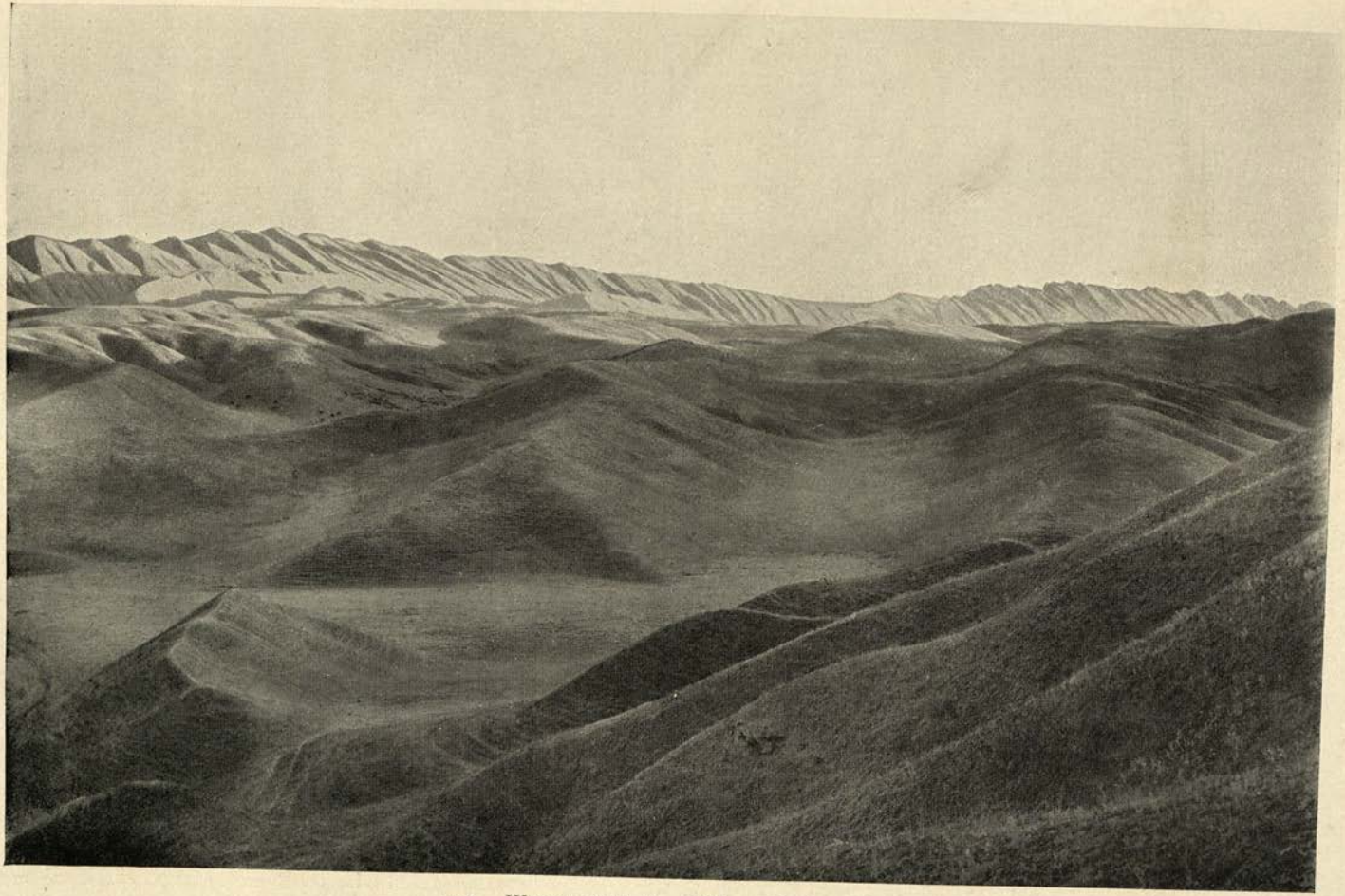
After Denau, where the Beg lives in a crenelated castle of mud (Fig. 21), the cultivated scenery gradually changes into steppe, the ground becoming more uneven and frequently disjointed by deep loess rifts (Fig. 24). Then we touch the edge of the watered plain. At Mirshadi there is a toll-house where we saw the customs official standing at his door and counting the long rows of camels preceded by their Uzbek guides on little donkeys. The loads consisted mainly

196. Hill Desert on the Turpak Pass.

197. Wind-shaped Hills at Sarikamish.



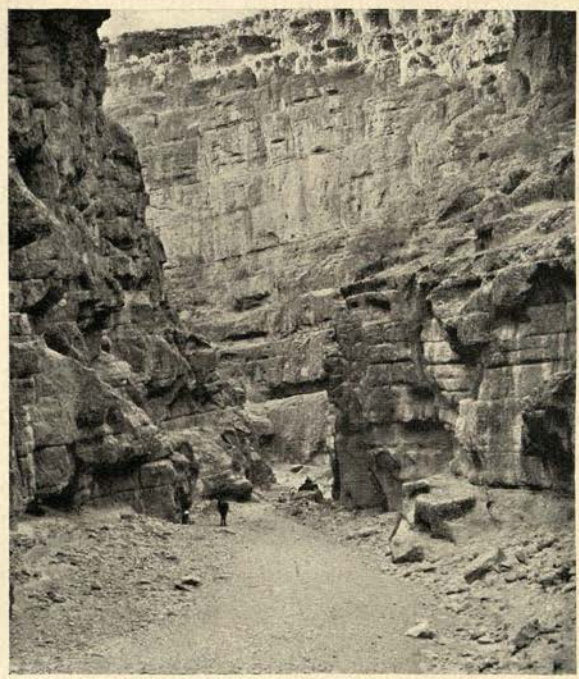
198. Honeycombed Sandstone at Sarikamish; the Result of Disintegration and Wind Action.



199. Waves of Earth; Hills at Sarikamish.

200. Sandstone on the Tirakli Pass near Baissun.

windings of the canyon. In winter or early spring a stream flows through the chasm, which is then impassable, and the travellers circumvent it by a path over the mountain. "Derbent," the name of the village at one end, means "defile." A town of the same name is situated on the shores of the Caspian sea where a narrow pass, also known as the Iron Gate, lies between the sea and the Caucasus mountains. To-day the natives call the gorge Buzgala-khana or house of goats, showing that mankind has become more prosaic not only in



201. The Iron Gate.

the West. What now is nothing better than a hiding place where peasants sheltered their herds in time of war, was, in the heroic past, the gate of the land whose iron portals shut themselves against the advancing host. Already Hiuen Tsang, the Chinese explorer of the seventh century, knows of the fame of the Iron Gate. According to the chronicles a heavy door hung in the defile, but in vain we looked for the spot where the hinges might have been.

In 1898 we had gone from the Iron Gate to Sharshauz by a short cut *via* Akrabat, Karakhoval, Kaltaminar, Yartepe and Yakasarai.

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5 1)' ' ; !(' (+*5 /3$)$/+')!:':' +3'' .$8 ; , . (+$!(' *$(-:/$1'' !:' +3'')'2.*$)!+5 , 6 +3'' 13'(, ; '($, 6 '), :!, ($(-+3'' 1)':')4$+!, (' , 6 $** +3'' 6,); :' , 6 5, . (2 -'1, :!+: ' , 8, -5 /$(' 6$!* +,' , 8:')4''+3''3.2''+'))$/':' , 6 +3'' C$)$6:3$(' (,)' +3'' -''1' /$(5, (:' /.+ +3), .23 +3' ;' 85*$+')$* :+)'$; :' 3'' *$/B , 6 $+ ; , :13')!/' ; , !:+.)'' $(-+3'')':.*+!(2 $8:'(/'' , 6 $(' '4'(*5 :1)'$-' /, 4')!(2 , 6 2)$::' ,)' 6,)':+ !:')':1, (:!8*'' 6,)' +3!:' :+$+'' , 6 +3!(2:' .)!(2 :. ; ; ')' $(-$.+. ; (' +3'' 2)'$+')!4'):' /, (:!:+ , 6 $*; , :+ (, +3!(2 8.+ 2*$/!')' @$+')' $ 6$/+ @3!/3 85 +3'' @$5 :.66!/!'(+*5 8'+)$5:' +3'' 2)'$+ 'E+'(+ , 6 2*$/!$+!, (' 3'' $; , . (+ /, (+)!8.+'-'85')$!(' ,)':1)!(2:'-.)!(2 +3'' -)!')' 3$*6 , 6 +3'' 5'$)' !:' 4')5 : ; $** !(-''-' 3')'6,)'' +3':'')!4')':5:+' ; :')' ; $-'' .1 , 6 /, ; 1$)$+!4'*5 6'@ *!(':').((!(2 +3), .23 8$))'(' ; $++')' 3'' :5 ; 8, * !:' $' +)''' @!+3 *, (2 2$.(+)$; !6!/$+!, (:' +3'' '(-:' , 6 +3'' :+), (2')' 8)$(/3':' 8'!(2 2*$/!'): ' +3'' *'$4':')'1)'7 :'(+!(2 :(, @' 1$+/3':' !+3 +3!:' *'+ .:' /, (+)$:+ +3'' (,)+3')(' :*, 1'' , 6 *1!('' .), 1'' !(' @3!/3 /$:'' +3'')!4')' +)'' ; .:+ 8'' /, ; 1$)'-', $:.//.*'(+ 2), @+3 , 6 !((. ; ')$8*'' /$1!**$)!':' 6!**!(2 .1 $(-' -)$!(!(2 +3'' :1$/':' 8'+@''(' +3'' +). (B $(-' 8)$(/3':' $(-' 8'+@''(' $** +3'' 8)$(/3':' 3'' ; $!(' /3$((':' $11'$)' ' ; 7 8'--'-'!(' $' ('+@,)B , 6 4'!(:' 1'); '$+!(2 +3'' :.8:+$(/'' +3), .23 @3!/3 +3'')!4'):' $)'' +)$/'- ' 3'' .$8!/')!4')' , (' +3'' , +3')' 3$(-' :'(-:' , .+ 8$)'' $(-' *$(B5 :3, , +:' !(+')*$/'-' , (*5 +, @$)-:' +3'' +, 1 *!B'' +3'' +3,)(5 1*$(+:' , 6 +3'' :+'11' ' 6,); .*$ 85 @3!/3 @'' /$(' 'E1)'::' +3':'' -!66')'(+ /, (-!+!, (:' !:' , (' 2!4!(2 +3'' 1'); $('(+ 1, !(+:' , 6 /, (6*.'(/'' , (' $ 2!4'(' :.)6$/'' '' :3$** +3'(' 6!(-+3$+ +3'' /$+/3 ; '(+ $)'$, 6 +3'' 3!('' 3$:' ; ,)'' 8), , B:' :+)'$; :' $(-' 1, !(+:' , 6 /, (6*.'(/'' +3$(' +3$+ , 6 +3'' E.:' (' +3'' /$:'' , 6 +3'' 3!('' +3':'' 1, !(+:' $)'' (, + , (*5 ; ,)'' (. ; '), .:' 8.+ $*:, ' ; ,)'' '4'(*5 -!:+)!8.+'-' 6 +3'')!4')' ('+ 3$:' /*, :')' ; ':3':' 3'(' /, (:.*+!(2 ; $1:' $' *$)2'' $(-' .(!6,); ' :/$*'' :3, .*-' 8'' /3, :'(' 6,)' !+' !:' +3'' -'+$!* @3!/3 8)!(2:' .+ +3'' /, (+)$:+ !(' $' :+)!B!(2 ; $(('))' '':'''6,)' !(:+$(/'' 3, @' +3'' +)!8.+$)!':' , 6 +3'' ; !--*'' E.:' 1$::' *!B'' +3), .23 +)$!(:' 6), ; ' +3'' 6, , + , 6 +3'' ; , . (+$!(:' 3$)-*5'-'!2(!(2 +, ' /, **'/+' $--!+!, (:' , (' +3'' @$5 3'' *$)2'' .), 1'$(')!4'):' 2), @' !(' 4, *. ; '' +, ' +3'!)' 4')5'' (-:' +3, :'

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,6 +3 ' .$8 !(/)'$:' +, $ /')+$!(1,!(+ $6+')@$)-: -!;!(!:3!(2 $(- ,6+'( ).(((!(2 -)5 8'6,)' $ *$B ' !:)'$/3'-

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,@ -!66')'(+ !: +3 ' $/+!,(,6 $ -!:/3$)2 ' ,6 $+;,:13')!/ @$+') $;,(2 +3 ' 6,,+3!**: ,) :.8$*1!(-!:+)!/+: ,6 +3 ' -.$8!/ +51 3 ' /,**'/+'-)$!(-),1:).(K.!/B*5 ,66 +3 ' :*,1': !(:'1$)$+' 2),,4': *'$4!(2 ,(+3 ' 2)!+ ,6 3,;,2'(,.: +'E+.)' +3,: :3$)1 :/$):)'1)':'(+!(2 !(+');!++'(+ @$+')/,.):': ,,($6+') +3 ' 1$::!(2 ,6 +3 ' /*,.-' '4')5+3!(2 !: -)5 2!($(- +3 ' :;$**') 1$)+!/*': ,6 :.(8.)(+ *!; : '+ !(+, $ 3$)- /';'(+ ** @$+') !:)$)1!-*5 /,(6!('-+, $:;$** (.;8') ,6 1');$('(+ /3$((': +3 ' 8$(B: ,6 @3!/3 !+)$)''*5 ,4'):+'1: 8'/$.: +3 ' 8'-: $)' -''1 ,@!(2 +, +3 ' ($)),@ *!(,6 ; '/3$(!/$* '66'/+ $: +':+!6!'- 85 +3 ' 6$;!*!$) /$(5,(3 ' 8$)'),/B: :.66') ;$!(*5 6),; :.--'(/3$(2': ,6 +';1')$+.)' 8'!(2 8*$:+'- $(- /3!11'- $: 1),4'- 85 +3 ' '(,);,.: 1)'4$*'(/' ,6 :/)'': 3 ' $!) 8'!(2 -)5 $(- +3')'6,)' /*'$)b$8:,)8: 4')5 *!++*' ,6 +3 ' :.(9: '( )25 $**,@!(2 !+:)$5: +, 8'$+ .1,(+3 ' :+,(': @!+3 6.** 6,)/' + (!23+ +3 ' 1),/': !: :.--'(*5)'4'):'- +3 ' :+,(': (,@: '(-!(2 +3 !) 3 '$+)$5: !(+, :1$/'' .(3$;1')'- 85 3.;!- $!) 3 ')':.*+ !: $)$1!- /,,*!(2 /$.:!(2 4!,*'(+ :+)$!(: !(+3 ' ;!(')$* :+). /+.)' *.6:'(:1'$B: ,6 -'+,($+!,(: $: *,.- $: 2.(:3,+:

@3'(' +3''),/B:' ,6' +3'' $; !):' 8'2!(' +,' /)$/B' $6+')' :.(:'+' !B'@!:'' 6)!/$(' +)$4'**'):' 3$4'' 6)'K.'(+*5' -':/)!8'-' 3,@' +3'' :+,('::' ,6' +3'' -':')+' 8.):+' @!+3' *,.-')'1,)+:',6+'('6*!(2!(2'@!-'' +3'' /3!1:'$(-':/$*':' 8*!:+')'-'6), ;' +3'!)':.)6$/'' +'!:'@,(-')6.*' @3$+' $'-!66')'(/'' @$+')'4$1,.)' ; $B':' $*+3,.23':+!**' !(4!:!8*'' +,' ,.)''5'' ' /')+$!('$; ,.(+',6'3.;!-!+5'!(' +3'' $!)'!:' 'K.$*' +,' +3'' +3!/B':+'6.)' /,$+' $:':3,@('85'+3'' *!++*'' (''-' +3')'' !:'!(' (2*$(-'6,)'+3!:'B!(-',6'2$);'(+' ('+3'' .$8'3,@'4')'!+'/$('8'' 'K.$**5'.:'6.*'!('@!(+')'$(-':.;;')'6,)')'+$!(7 !(2'+3'' 3'$+',6'+3'' 8,-5'$(-'B'' 1!(2',.+'+3'' :+!(2',6'+3'':.(

:'/,;1$)'-' +,' +3'' *1:' +3'' 1)':'(+'/*!;$+!/'/,(-!+!,(:',6'+3'' .$8'$)'' 'E1)'::'-'85'$'/3$(2'-')'*$+!,('8'+@''('+3''4$)!,.:'::)6$/'' $2'(+:',6'-':+).7 +!,(')+)$(:1,)+'$(-'-'1,:!+!,(' '$+3')!(2'!:';./3':+),(2')')+)$(:1,)+$+!,('85' @$+')' $+' +3'' :$;'' +!;'' 8'!(2'@'$B')':3,)+')'$(-'/,(6!('-'+,' ($)),@')'*!('::' □3')'85'$//.;.*$+!,(' +$B':' 1*$/'' ;./3'('$)')'+3'' ,)!2!(',6'+3'' 8),B'(' 6)$27 ;'(+:'6.)+3')'!(:!-''+3'' ;,.(+$!(:'$(-'$+' $'3!23')'*'4'*':' :3,@('85'+3'':!H'' ,6':/)'':'+'))$/':' ;,)$!(':'$(-' ;.-:1$+':'!(' +3'' 4$**'5:'$(-',('+3'' :*,1':' '(/''+3''6)'K.'(/5',6'!;1$::$8*'')!4')'2,)2':'/!)/.;4'(+'-'85'1$::':'$(-',6' /$(5,(:'('(2)$6+'-',('8'-),/B'8.)!'-'!('-'+)!+.:' □3''/)':+:',6'+3'' $;!):'$)'' ';8'--'-'!('$'2*.+',6'2*$/!$*'2)$4'*' '',8:')4''$'2)'$+'1)'1,(-')$(/'',6' @3$+' !)$)-!('L $.+'' $.)!'((''7'%51 '%& FM'/$**:'81 '

&7'($;'*5'1),/'::':',6'+3'' ;,)'' 4!,*'(+'$(-'4!:!8*''B!(-':./3'$:'6$**:',6'),/B'*$(-:*!-':'!/''4*$(/3':';.-:1$+':'8)'$B!(2',.+',)'-)5!(2'.1',6':;$** *$B':'$)+3K.$B':'4*$(/3''+)$(:1,)+')'!4')'6*,,-:''+/' *$/!')6'-')!4'):' !(:!2(!6!/$(+'!('+3'' ;,)(!(2':@'**+,'$('$;$H!(2'4,*.;''K.!+'':.--'(*5',('$' /*'$)'3,+'-$5':,'+3$+'+3''+)$4'**')''E1')!'(/':':,;''-!66!/.*+5'!('':/$1!(2'6),;' +3'':.('E1'/+'-',().:3' '-!(';'(+!,(:'.3'$'/$:''!('+3'' 3!(':'' $;!):' .(+!(2+,('2!4':'$'2)$13!/'$//,.(+',6'3,@',(/''3!:'1$)+5'/),::'-'$':+)'$;*'+' @!+3,.+',+!/!(2'!+'$(-'3,@'$6+')'$':1'**',6')$!('!+'2)'@'!(+,'$'+)';'(-,.:')!4')

('3!:'1$1')',(' !;$*5('),:!,(')' '4''-)$@:'$++'(+!,('+,'$'1$)+!/.*$)' 6$/+,)''E1*$!(!(2';$(5'B!(-)'-'13'(,;'($' $)2''-'1,:!+:'.3'$:'8,.*-')' /*$5',)':*,1''2)!+'$//.;.*$+'-'.(-')'+3'':@$5',6'$'-)5'/*!;$+''L,)'1')!,-',6' -)5'5'$):M'/$(')':+'$+'$':+''1'$(2*''@3')'$:'.(-')'3.;!-'/,(-!+!,(:'+3'5';.:+' :1*$5',.+'!('$'6*$++')'2)$-!'(+' 6':./3'$'-'1,:!+'2'+:':,$B'-'85'$';,)''+3$(' ,)-!($)5')$!(6$**'85'$'-'4!$+'-':+)'$;',)';'*+!(2':(,@'!+'@!**'8'2!('+,':*!-'',)' /,**$1:'''!(',)-')'+,'$::.;''+3''$(2*''$-$1+'-'+,'!+:'('@':+$+''□3'')':.*+'!:' :''('!('+3'':3$1'',6'*$(-:*!-':'$(-';.-:1$+':' ;''',6'+3'':*!-':'-':/)!8'-'85' '4'')';!(-';'',6'@3$+''':$@',('+3'':*,1':',6'+3''C2)$'1$::'L 3$1'S M' '':$5:'Q' ('*$(-:*!-''3$:'8''('!(')1),2)'::'6,)';$(5'5'$):'$+' ,5'(',('+3'' !*2!+'),$-' □3'':*,1'':' E@Y' 8.+'+3''@3,*''3!**:!-''6,)';,;'' B@@@ 6''+'!:' /)$/B'-'$(-'/)!(B*'-'$(-'!:'4')5'2)$-.$**5':'++*!(2'-,@('+,@$)-:'+3'')!4')' □3'':$;'' @)!+')'!:'$*:,':+).B' 85'+3'' 4!4!-'/,*,.)!(2',6''$)+3'+,' @3!/3' 3$4''6)'K.'(+*5'-)$@('$++'(+!,('Q' 6+')':,;''@''B:',6'+)$4'*'!(' $-$B'$(-

$*+!:+$(' ,('' 2'+:' $//.:+, ; '-' +,' +3'' :!23+' ,6' +!*+'-' :+)$+$' ,6'4$)!,.:' +!(+:' :+)!1':' ,6'1!(B' $(-' 8),@(' !(' @$45'*!(':' @!+3' 2)''(' :*$+' '*!23+' 1!(B' 2)$(!+':' $(-' 2)'5'*!; ':+,(':' 3$); ,(!H'-' 85' $' :,6+' 8*.'' $+; ,:13')'

',*,2!/$**5':1'$B!(2' +3'' .$8' ; ,.(+$!(:' 3$4'' 1)':')4'-' ; $(5'+)$/':' ,6'5,.+3' $:' :3,@(' 85' +3'' !; 1,)+$(+' 1$)+' 1*$5'-' 85'*!; ':+,(' ' :$(-:+,('' $(-/,(2*,; ')$+'' !(' +3'' $)/3!+'/+.)'' ,6'2)'$+' 1'$B:' (' +3'' *1:' ,@!(2' +,':+),(2')' +)$(:1,)+' +3'' 2)$(!+'' /,)'' 3$:' 8''(' -'1)!4'-' ; ./3' ; ,)'' ,6' !+:' :'-!; '(+$)5' ; $(+*' '@3')'85' $**' *!; ':+,('' 1'$B:' $)'' -'2)$-'-' +,' *':':')')$(B' $; ,(2'+3'', .+')')!-2':' □,' +3!:' ; .:+' 8'' $--'-'$'*$+'' /,(+!(.$(/'' ,6'+'/+,(!/' ; ,4'; '(+:' $:' @!+('::'-' 85'+3'' '$)+3K.$B'')$-!.:' /,4')!(2' !')(5' (-!H3$('$(-' $)$+$23' (' 3!(':'' □.)B':+$(' .(+!(2+,('3$:''4'('6,.(-'*$4$':+)'$;:' ,4')*5!(2'2*$/!$*' -'1,:!+:' //,)-!(2' +,')$66+' +3'' 6,*-!(2:' ,6' $)@$H' $)''1,:+ ',/'('' /,.1*'-' @!+3' @$)1!(2:' $(-' 6$.*+!(2:' ,6' $' :+!**' ; ,)'')'/'(+' $2'' (-,.8+'-*5' +3'' .$8' ; ,.(+$!(:' 2!4'' ,('' $(' !; 1)'::!,(' ,6'2)'$+')' 2'(')$*' :+''1('::'*,,B!(2' ; ,)'' 1)'/!1!+,.:' $(-' +3)'$+'(!(2'+3$('+3'' *1:' □3!:' ; $5'8''$:/)!8'-' +,' +3'' /,; 8!('-' '66'/+' ,6'2)'$+')' $8:,*.+'' 3'!23+' $(-'*'::')')'*$+!4''2*$/!$+!,('□3'' /,))!':',6'+3'' !/''$2'' 3$4'' 8''('-':!//$+'-' +,' $'2)'$+')''E+'(+'$(-' +3'' 8'*+',6':,6+' 2*$/!$*' 4$**'5'6,); :'3$:' 8''('; ,)''),.23'('-' 85'@'$+3')7!(2'$(-' '),:!,('□3.:' +3'' :3$)1')!-2':'$(-'1)!:; :'3,**,)'-',.+' 85'/,))!':'+3'' 15)$; !-:',6'+3'' ')(':'' 8')*$(-'$(-'+3'' $!2.!**':',6' 3$; ,.(!E')!:!(2'$8,4'' +3'!)':(,@ 6!'*-:'$)'' !('+3'' .$8'/,(+!(.'-'-,@(@$)-:'+,'$'*,@')'*'4'*#+,@')!(2'6'$):,; '*5'$8,4''+3'' -''1*5':.(B'('8'-:',6'2*$/!'):'$(-'6!4'):

□3'' -)5('::',6'+3'' $+; ,:13')'' +3'' $8:'(/'',6'$' /,4!<)!(2':,!*' $(-'4'2'+$7+!,('2!4'' 6)''' 1*$5'+,' +3'' /,(+)$:+:',6'+' ; 1')$+.)'' $(-'+,' +3'' '),:!4''6,)/'',6'@$+')',)'@!(-' □,' +3'' /3$)$/+')!:+!/' +)$!+:'@3!/3'+3!:':+$+'' !; 1)'::':'.1,('+3''6$/'',6'+3'' ; ,.(+$!(:'+3'' -':')+' $+'+3'!)'6,,+':+$(-:'!(' -!)'/+')''*$+!,('8'!(2'$'('/'::$)5'$-?.(/+' ; ,)',4')',('' /$1$8*'' ,6'$22)$4$+!(2' /*!; $+!/'6$/+,):'85'+3''2),@!(2'$//.; .*$+!,(',6'3,+':$(-' ':')+:'/$('1)'$-' @!+3' $; $H!(2')$1!-!+5'@3')'4')' /,(-!+!,(:'+'(-'!('+3'!)'6$4,.)',)' ; $(9:' @$+/36.*(':::')''*$E':' □,'B''1'+3'' -':')+' @!+3!('8,.(-:'!:'-!66!/.*+' '(,.23'+,'2$!(',('!+'!:'+3''@,)B',6'2'(')$+!,(:'$('!(/3'6,)'4')5'5$)-'+3'' '('; 5'3$:'-4(/'-'+3),.23'/$)''*':::7('::',)'-':+).//+!,(' '2)'$+'-':')+' 85'+3''1,@')',6'!+:'$+; ,:13')'' 3$:'+3''+'(-'(/5',6'1.:3!(2'!+:'8,.(-$)!':'+,'+3'' .++'); ,:+'*!; !+'+,'+3'' ; $!('@$+')7:3'-'6,)/!(2'8$/B'+,@$)-:'!+'+3'')$!('8'*+'+!; 8')'*!(''$(-':(,@'*'4'*' 5':'(-!(2'6,)+3''4')5'4!*$8*''' 'E/'::',6').((!(2'@$+')'-!:+)!8.+!(2'!+'@!+3':+)!/+'/,(,; 5' ; $(' ; $5'$-4$(/'*'6'@':+'1:'8.+'+3!:'8,)-')',6',$:':'!:'* ' (,+3!(2'+,'+3'' '(-*':'@$:+'' 8'5,(-' (-')*5!(2'+3'' ,$:!:'+3')'' !:' $*@$5:'+3'' /,(7-!+!,(',6'+3'' -':')+'+3'' !))!2$+'-'1$)$-!:'' 8'!(2'8.+'' (2)$6+'-'.1,('$':,!*.(-')'+3'' :@$5',6'$' /*!; $+'' !(!; !/$*'+,' 4'2'+$+!,(' □3'' ,$:!:' :@!; :' !(' +3'' -':')+'*!B'' $' :3!1',(' +3'' :'$' □,' :,$B'+3'' @3,*'' ,6'+3'' -':')+' !:' $:' 3,1'*'::'6,)'3.; $('66,)+' $:'+3'' 6!**!(2'!(',6',/'$(:' □3'' *,('*5'$:1'/+',6':'$' $(-' -':')+'+3'!)' '4')' '(/),$/3!(2' ; $*!2(!+5',)')'*'(+*'::'6.)5'+3'' -$(2'):',6'+3'!)' @!-'

'E1$(:'' !(:1!)'' ;$(B!(-' @!+3' 6'$)' □3'' *'$:+' 2)$+!+.-'' +,@$)-:' +3';' !:' 1),8$8*5' 6'*+' 85' +3'' 6!:3');'(' $(-' 2$)-'():' $*,(2' +3'!)' :31)':' '$' $(-'-':')+' $)'' !(-!:1'(:$8*'' 6$/+,):' !(' +3'' 3,.:'3,*-' ,6' ($+.)'' 8.+' +3'!)' .:':' $)'' (,+' 6.**5' 11)'(+' +,' !;';-!$+'' ,8:')4$+!,(' '+@''(' +3';' +3'' 3!23' ;,.(+$!(:' 6,);' $' *!(B' 1),-./+!4'' ,6' +3$+' 1'/.*!$)' +51'' ,6' *$(-:/$1'' @3')''5'**,@' -),.23+' $(-' $*1!('' :(,@:' $)'' !(+')*$/'-' !(' /.)!,.:' 6$:3!,(

' 3,1''+3$+'6),;' ;5'8,.B'+3'')'$-')'3$:'2$!('-'$('!;1)'::!,(',6'+3''/3$)$/+')' ,6'+3'' .$8' $:' $'2',2)$13!/$*'+51'' (',)-')'+,'.(-'):+$(-'6.**5'!+:')'*$+!4'' !;1,)+$(/''$;,(2'+3'' 6'$+.)':' ,6' :!$' 3'' :3,.*-' $*:,' :+.-5'+3'' ('!238,.)!(2'-!:+)!/+:' @3')'85' 3'' /$(' ;$B'' +3'' .$8' :+$(-',.+' $:' $(' !(+');'-!$+'' +51''8'+@''(' +3'' 'E+)';':',6' '(+)$*' :!$'1),1')' L ,1' 8$:!(' $(-' □!8'+M' $(-' +3'' ':+')(' $./$:.:' +'!:'3$)-*5'1,::!8*''(,)'4'('1');!::!8*''+,'2!4''$':3,)+'$(-'/,(/!:'' -'6!(!+!,(',6'+3''+');' Q'-.$8!/ 0'?.:+'$:'*!++*'' $:',('' /$('1),1')*5',.+*!('' $' ;$(9:' /3$)$/+')' 85':./3' 2'(')$*!+!'':' $:' /3,*')!/' '('')2'+!/'$(-' 8)$4'' '' /$((,+':$5'!('$':@''1!(2'6$:3!,('6,)'!(:+$(/'' +3$+'-'(.-$+!,('$(-'$//.;.*$+!,('$)''K.!/B')',)':*,@')'+3$('!(' +3'' *1:'$:':,';./3'-'1'(-:',('K.$*!+5'K.$(+!+5'$(-''E$/+'*,/$+!,('@!+3!('+3''4$:+')'2!,(' □3':'' 1),/'::':'$)''!(+');!(2*'-'!('4$)!,.:'@$5:'/3$(2!(2'3$(-:';$(5'+!;':'$(-'!('4$)5!(2'-'2)''*$*,(2'+3''*!('' 6),;'+3''3!23':.;;!+:'+,'+3''8,++,;',6'+3'':'$' ,)',4')'+3''@,)B',6'/*!;$+'' !:'/,;1*!/$+'-'85'2',*,2!/$*'!(6*.'(/':'$(-'+3')''!:'(,+3!(2';,)'' '66'/+!4''+3$('$'),+$+!,(',6'6,)/':' □3'' 2)'$+':+'$(-';,:+')$1!-'/3$(2':'$)'' 1),-./'-'85'/,;8!('-',)'$*+')($+'' $/+!,(' ,6'+'/+,(!/'-!:+.)8$(/':' L.13'$4$*'$(-':.87:!-'(/'M' $+;,:13')!/'-'(.-$+!,('$(-'-!:!(+'2)$+!,(' '),:!,(' +)$(:1,)+'$(-'$//.;.*$+!,('85'@$+')'@!(-'$(-'!/'' *!4')5',('' B!(-',6''(')25'!:':,;'3,@'$1+',':1'(-'!+:'*6'!(' +3'' !(/)'$:!(2'K.$(+!+!':',6'!+:',@(' 1),-./+:',)'+3'')'-./+!,(',6'!+:'*'4'*:',)'+3'' 2),@!(2'@'!23+',6'!+:'.1*!6+!(2:'!6'.(!6,);*5'1.):.'-'6,)'$'*,(2'+!;'' /+!,(';''+:'!+:',@(')'$/+!,('$+'$('4')'!(/)'$:!(2')$+'':,'+3$+'$8,.+'3$*6'@$5'+3),.23'+3'' +$:B'1),2)'::'8'/,;':':,'1$!(6.**5':*,@'$:'+,'8'' $*;,:+'+$(+$;,.(+',$':+$(-:+!**' □3'' !-'$*''(-':./3'$:'+3''$8:,*.+'*'4'*'+',6'-'(.-$+!,('!:')';,4'-'+,'!(6!(!+5' '$/+!,(')'+$)-:':,';./3'+3$+'(,+3!(2'8.+'$')'4,*.+!,(',)')'6,);'@!**2!4''('@'*!6''85':,;'':,)+',6')'4')7:!,(',)'/3$(2'',6'+$/+!/:'85'+3'':'++!(2'.1',6'$'6)':3'*'4'*',6''(')25',)'+3''6!(-!(2',6'$(,+3')'$(2*'',6'!;1$/+' □3'' 2)'$+':+''66'/+:'$)'' 1),-./'-'85'$'),+$+!,(',6'6,)/':'85'$'/3$(2'' /*!;$+'' $(-'*'4'*'85'$':;$**'+'/+,(!/'/$+$:+),13''3')''$(-'+3')''85'@$+')'@!(-'$(-'!/''+$B!(2'$*+')($+''*'$-:'!('+3''/,(+!(.$+!,(',6'+3''-':+)./+!4''$(-'/,(:+)./+!4''@,)B',6'+3'!)'/,(+';1,)$)!':',)'1)'-'/'::,):'$++$/B!(2'+3'!)':+$2($+!,(':6),;'$'('@'8$:'',)'85'('@'-'4!/':'/$))5!(2'+3''6)$2;'(+:'!+3')'+,'+3'':$;''-':+!($+!,(',)'8.!*-!(2'.1'!('6)':3'1*$/':'*,@')!(2'@3')''+3'5'3$-')$!:'-',)'4!/''4'):$'-'1,:!+!(2'@3')''+3'5'3$-'1*$('-'$(-'3,**,@'-' □3'' $+;,:13')''3$:'*!++*''' '66'/+',(':;,+3'@$+')@,)(''1'88*':'G @!(-'/$((,+'@')$'$@$5'4'2'+$+!,(G'@$+')'!:':+),(2*5')':!:+'-'85'/*$5G'.13'$4$*'!:'*!;!+'-'85'+3''8.*B'.13'$4'-'$(-'),:!,('/,;':'+,'$':+$(-:+!**'*,(2

8'6,)'' +3'' $8:,*.+'' 1*$!(' !:' @!+3!(' :!23+' (' +3'' ,+3')' 3$(-' 6),:+' $(-' 3'$+' $)'' 1,!:,(' +,' +3''),/B:' 6)':3*5' .(6,*-'-' 6),;' +3'' @,;8' ,6' '$)+3¢ @$+')' -),@(:' +3'' -':')+' $(-' @!(-' -!:1'):':' -)!'-' .1' /*$5¢ 6.)),@!(2' 2*$/!'):' 6!(-' 2,,-' 1.)/3$:'' .1,(':*,1':')'(-')'-' 6)!$8*'' 85' $!)),+' $(-' /),:: :/$))'-' 85' @$+')' +3)'$-:' @3!*'' +3'')!4'):' *,$-' +3' ;:'*4':' @!+3' +3'' :+,(''6*,.)' ,6' +3'' 2*$/!$*' ;!**:

□,' +3'' :+.-'(+' -':!),.:' ,6' .()$4'**!(2' +3'' !(6*.'(/'' ,6' *$(-:/$1'' .1,(' +3'' ($+.)'' $(-' 3!:+,)5' ,6' ;$(' +3'' .$8' ,66'):' $(' '(,);,.:' 6!'*-' ,6' !(4':+!2$+!,(' ,.(-' .1' @!+3' +3'' $+;,:13')!/' $(-' ;,)13,*,2!/$*' /,(-!+!,(:' !:' +3'' *!6'' ,6' +3'' ($+!4'' ;,.(+$!('')' □3'' !(3$8!+$(+' ,6' +3'' C$)$6:3$(' 4$**'5' 3$:'),$-:' ,4')' +'))$/':',)' ($B'-' $(-' 1)'/!1!+,.:' :*,1':' @3!/3' +3'' $./$:!$(' 6!(-:' ,8:+).(+'-' @!+3' .(-')2),@+3' $(-' 6$**'(' +)'':' 8,4'' +3'' +)'' *!('' +3'' $)+9:' 3,):'' ;.:+' :+)!B'' 3!:' :3,'' !(+,' $' 3$)-':.8:+$(/'' @3!*'' +3$+' ,6' +3'' .$('+!$(' @$*B:' ,(':,6+' ,)' ;.--5'' $)+3' ,)' :+).22*':' @!+3' +3'' *,(2'2)$::' ,6' 8'$.+!6.*' ;'$-,@:' ')'' +3'' /),1:' ,6' +3'' 4!**$2'):' ;,:+*5'-'1'(-' .1,(' $(' $)+!6!/!$*' @$+')' :.11*5' +3')'' +3'5' $)'' '(-$(2')'-' 85' $' 1,::!8*'' 'E/'::' ,6')$!(' ,@' $)/3!+'/+.)'' 3$:' 8''('' '4,*4'-' 85':.)),.(-!(2:' $(-')$/!$*' +';1')$;'(+' !:' 11)'(+' +,' +3'' -.**':+' '5'' $:' !+' @$(-')':6),;' +3'' @!::' /3$*'+' +,' +3'' :*$+' /,4')'-' 6,)+)'::' ,6' .$('+!$' $(-' +,' +3'' /.8':' ,6' +3'' .$8' □3'' +,1,2)$13!/' (./*'.:' ,6' +3'' $;!):' !:' 6.**' ,6' ;'$(!(2' @!+3')'2$)-' +,' +3'' -!:+)!8.+!,(' ,6' +3'' 1',1*':' 6,);!(2' $' 1),;!('(+' *$(-;$)B' 6),;' @3!/3' +,' +$B'' 8'$)!(2:' ,6' +3'!)' @$(-')!(2:' $(-' 4!/!::!+.-':' >.:+' $:' +3'' 3'$)+' ,6' $' ;,.(+$!(')$(2'' B''1:' @!+3!(' !+:' !((');,:+' 6,*-:' +3'' ,*-':+'),/B:' :,' !+')'+$!(:' +3'' ,*-':+')';$!(:' ,6' 852,(' ')$/':' +' !:' $:' !6' +3'' :3)'-:' ,6' 6*,$+!(2' 3.;$(!+5' 3$-' /*.(2' +,' +3''?$22'-' /*!66:',)' $:' !6' +3'!)')';,+':+' $(-':+!**':+' 8!23+:' 3$-' 1)'':')4'-' +3'')$)':+':'-!;'(+:' *'6+' 85' +3'':.)2!(2' @$4':' ,6';!2)$+!,(

□3'' $*/3$:',//.15' +3'' 3!23')'!(+')!,)';,.(+$!(' 4$**'5:' @!+3' +3'' 'E/'1+!,(' ,6' +3'' +).'' $;!):' @3!/3' $)'' 1)$/+!/$**5':+'11'' $(-' @3!/3' 3$4'' $*@$5:' 8''(' '$:!*5' $//'::!8*'' '*,@'$(-',.+:!-'' ,6' +3'' $*/3$:' $)'' 6,.(-' +3'' ;$?,)!+5',6' □$?!B:',(' +3'' :*,1':' ,6' +3'' *$!',(' +3'' ;!--*'' C$)$6:3$(' !(' $)$+'2!(' '+/' □3.:' $:' @'' 1$::',.+',@$)-:' +3'' 1*$!(:' +3'' 1,1.*$+!,('8'/,;':' ;,)'' $(-';,)'' ;!E'-' $(-' 6!($**5' K.!+'' ,(2,*!$(',)' □.)B!':,' +3$+' +3'' 1.)':+')5$(:' $)'' 3!23':+' +3'' 1.)':+' ,(2,*:' *,@':+' @3!*'' !(' 8'+@''(' +3'' 8*'(-:' ,//.15' +3'' *$(-',6' 1*'(+5' :' 5'+' !+' !:' !;1,::!8*'' +,' ,8+$!(' 'E$/+' 6!2.)':' 6,)' $*/3$:' □$?!B:' $(-' H8'B, $)+:' ,@!(2' +,' +3'!)' (,+' 8'!(2' :.66!/!'(+*5' 3'*-' 1)+' !(' /'(:.:')'+.)(:' ,)' $)'' +3'' '+3(,*,2!/$*' K.':+!,(:' K.!+'' /*'$)'-' .1':,' +3$+' ;./3$)';$!(:'+,'8'' -,(''85' +3'' 'E1*,)')',6';$(B!(-' □3'' H8'B, $)+:' $)'' .(-,.8+'-*5' +3'' ;,:+' (.;'),.:',6' +3'' :'++*'-' +)!8':' 6$!)*5' ;,(,1,*!:!(2' +3'' 4!**$2':' $(-' /!+!':',6' +3'' !))!2$+'-' 1*$!(:' 6',(''):';8'):+3$+' +3'' :+'11'',6' +3'' *,@*$(-:' $(-',6' +3'' $;!):' !:' !(3$8!+'-' 85' □.)B,;$(:' $(-' !)23!H' !+' @!**' 8'':''('+3$+',(''/$((,+' 2,'6$)'@),(2'!(' +$B!(2' +3'' 6,);$+!,(',6' $' /,.(+)5' $:' $' 2.!-'' +,' +3'' -!:+)!8.+!,(',6' !+:' 1',1*':' □3'' 2)'$+' ;!2)$+!,(:' 3$4'' 6*,@'-' $),.(-' +3'' 8$:'' ,6' +3'' ;,.(+$!(:' $*+3,.23' +)$-'):' $(-' 1!*2)!;:' @!**' 6,)/'

+3'!)'@$5',4')'+3'' ; ,:+'3,))!8*''1$::':':'$:':3,@('85'+3'' $)$B,)$; ' '(/''!('
:,;''!(:+$(/':'@'' ;$5'$*:,'$::. ;''$':*,@')'B!(-',6'; !2)$+!,('::./3'$:'8'+@''('
(-!$'$(-'□!8'+'85'$'4')5'2)$-.$*'1),/'::',6'6!*+')!(2'+3),.23'$*1!(''',8:+$/*':
'@':3$1':',6'::.)6$/''$)'':,''E1)'::!4'',6'+3''!(+')-'1'(-'(/'',6'135:!/$*'
/,(-!+!,(:'$:'+3'')':/'(+',6'+3'' 3$($+'',6' ,B3$)$'8':+':''('(',('$'; $1'@!+3'
/,*,.)'-' 1,*!+!/$*'6),(+!'):' .+*!('-'85'+3'' E.:'+3!:'8),$-':+)!1'!:'6,*-'-'
$),.(-'+3''/'(+)$*'; $::',6'+3''*$! $; !):' ,(2'4$**'5:' -.'':+,':+),(2')'
'),:!,(',('+3'':!-'',6'+3'')$!(8'$)!(2'@!(-:'/,(4')2'':+,@$)-:'+3'' $; !):'
)'1)':'(+!(2'+3'' 1$*;' ,6'$'3$(-'@!+3'6!(2'):':1)'$-'+,@$)-:'+3''@':+',)'+3''
+,1',6'$'3.2''6$('1),?'/+'-'!(+,'+3''1*$!(:' *,@!(2'),.(-'+3''6,,+',6'+3''
;,.(+$!(,.:''E1$(:''+3'' ; .-$)5$'/,(('/+:'+3''(-:',6'+3''*$)2''+)!8.+$)!':'
*!(B!(2''$/3')$-!.:'+,'+3''/,;;,('/!)/.;6')'(/'' □3.:'+3'' ,B3$)$'3$*67
;,,('!:'$':'/+,)'4,*4'-'6),;'+3''/'(+)$*'; $::'@3!/3'!;1)'::':'!+:'!(6*.'(/''
.1,('+3'':.)),.(-!(2':1$/':',6''$)+3'-'+');!(!(2'+3''/,(6!2.)$+!,('',6'+3''
2),.(-'+3''$))$(2';'(+',6'+3'')!4')':5:+';'$(-'+3''-!:+)!8.+!,('',6'*!6''('
+3''/,.):'',6'3!:+,)5'+3'':@''1!(2'/.)4'',6'+3'' E.:'3$:':')4'-'$:'$'1,*!+!/$*'
6),(+!')'$(-'!+':+!**'!:':,'+, -$5'@3!*''!('+3'')';,+''1$:+'$:'@'**'$:'!('; ,-')('
-!1*,;$/5'+3''1*$+'$.*!B''*'4$+!,('',6'+3'' $;!):'3$:'3'*-'+3''!;$2!($+!,('',6'
+)$4'**'):':,*-!')':'$(-':+$+':;'(□3.:'8'+@''('$'/!)/.;6')'(/''$(-'$';!--*''
,6'E/'1+!,($*'2',2)$13!/$*'!(+')':+'+3'':'!/!)/.*$)'$)'$*!':'-'1*,5'-'$:'8'+@''('
+3'':,.)/''$(-'+3''8,.(-$)5',6'*!6' !-@$5'8'+@''('+3':''*!':'+3'')$-'),.+''
,6' !--*'' ,B3$)$'@3!/3'6,);:'$('!(('),/,(/'(+)!/'/!)/*'',/,(('/+!(2'+3,:''
6')+!*''-!:+)!/+:'@!3')''+3'')!4')':'!::.''6),;'+3'!)'2,)2':'+,'.(!+''@!63'+3''5'**,@'
,'::'@3')''+3'';$(5'6$/+,):',6'2',2)$13!/$'!(+')$/+!,(':+)!B''$'3$115';'$('
8'+@''('+3''!/5';,.(+$!(:'$(-'+3''$)!-'1*$!(:

6=30

,)'+3!:'1$)$2)$13''/$(',(*5'/*$!;':,;''2'(')$*',8:')4$+!,(:'$:';5',@(
),6'::,)'4,(' !/B')'3$4!(2'2!4'(';''*'$4''+,'.:''3!:' /$-';5')'1,)+' '
9 '**';'+',),*,2!/$*'6!2.)':'$)''+$B'(6),;' !/B')9:';,(,2)$13'$(-'
$;!9:'2)'$+':+$(-$)-'@,)B',(/*!;$+,*,25' □,'+3':'' ';.:+')'6')'+3'':+.-'(+'
-':!),.:',6'$/K.!)!(2'-'+$!*'-'B(,@*'-2'',6'+3''/*!;$+!/'/,(-!+!,(:',6'+3'' .$8'
$(-'('!238,.)!(2')'2!,(:' □3'')'1,)+:',6'/3@$)H'$(-' *.6:'('$(-'+3''-!$)!':'
,6')$.')' !*-'L '(/!'4,(' !/B')M'3$4''$*:,'8''('')'6'))'-'+,
:'$'@3,*''+3'' .$8'!'.(-')'+3'':@$5',6'$'.(!6,);'/,(+!('(+$*!+5'8.+'!+'
@!**'8''@'**'+,')';';8')'+3$+'!+':+)''+/3':',4')'; $(5'-2)'':',6'*$+!+.-''$'6$/+'
+,'8''8,)('''!(';!(-'@3'('/,;1$)!(2'+3''+';1')$+.)':',6'4$)!,.:'1*$/':''4'('
$6+')'3$4!(2'$**,@'-'6,)'$*+!+.-'' ,.23*5',(''; $5')'/B,('$'6$**'',6'!R'6,)''4')5'
-'2)''',6'3!23')'*$+!+.-''L*R'!('+3''1*$!(:')K#'!('+3'';,.(+$!(:M' !B'@!:''+3''
6!2.)':'2!4'('8'*,@'L/.**'-'6),;' $((M'/$(',(*5'/,(4'5'$'4')5'2'(')$*';1)':7
:!,(''($8*!(2'+3''')'$-')'+,' ;$B''/,;1$)!:,(:'@!+3' ;,)''6$;!*!$)'1*$/':'
/,4')!(2'$':!;!*$)')$(2'',6'*$+!+.-'

□ ' ; 1 ')$+.)'' $(-')'/!1!+$+!,(' ,6' $' 6'@' 6$; !*!$)' 1*$/':

- $ '

					E+)';':	
:& ' '; 5 'M	>$(.$)5	>.*5'	'$)	$(2'	!(!;.;'	$E!;.;
$!),'J ';	% JR	D AR	%U R	%F DQ	I*R	= R
*'E$(-)!$'J ')$	&I*	F' A	J	%%&	J	'(D&
$1*':'%F ';	D A	=IA		!AU	0	0
,;'':,';	A	=ID	5&	!D !	0	0
((:8)./B'A ';	'7'	% D	&	/ I	'! 9,	'!5'
.(!/3'FJ ';	O' 9A	I	(7'	%	0 &	J
')('' F ';	/6'	% A	(6,	%& &	' =I	&
!*:' $)!$'%D% ';	D %	%%I	!%F	!*D'	0 I	IF
$(+!:' F ';	D D	)6.	O' A	-'6,	J	!F%F
,((8*!/B'J% F';	! '5'	.6*	A U:	%F	J %	*6+
!2!B.*;'% DF';	&U	*5*		%= =	!D D	I

Q $(2'0' :+$(-' 6,)' +3'' ;'$(' $((.$')$(2'' @3!/3' !:' +3'' -!66')'!*/'' 8'+@''+*' +3'' ;'$(:' ,6' +3'' 3,++':+' $(-' /,*-':+' ;,(+3' Q E+)';':0' :+$(-' 6,)' +3'' 'E+)';' $((.$')$(2'' @3!/3' !:' :3,@(' 85' +3'' ;'$(:' ,6' +3'' 3!23':+' $(-' *,@':+' +';1')$+.)'c ,6' '$/3' 5'$)' -.)!(2' $:')!':' ,6 5'$):

< '!23+' ,6',8:')4$+,)5' L/6' $1*':M'

& ' '

.(2$)5	F&	!--*'' +$*5	D=
')('	&J	,.+3')(' +$*5	D
□!),*	%%F	!/!*5	A
$(+!:	F%	$*+$	R
!*:' $)!$	&	*'E$(-)!$	
+$*!$(' *1:	% %	,)+' $!-	D
,' $**'5	D%	$!),	J

,)' +3'' 1.)1,:':' ,6' -':/)!1+!,(' $(-' /,;1$)!:,(' !/B')' -!4!-':' !(+,' '!23+' 2),.1:' +3'' % ';'+',),*,2!/$*' :+$+!,(:' ,6' .::!$(' □.)B':+$(' :' ' $;' 2!4!(2' ,(*5' $'4')5'/.):,)5')'4!'@' %')':+)!/+';5:'*6'+,' +3''6!4'' ;,:*!;1,)+$(+':'/+!,(:' ($;'-' 8'*,@' $(-' 8'*,(2!(2' +,' +3'' .$8' 1),1')' //$:!,($**5' ' :3$**')'6')' +,' +3'' ::!B B.*')'2!,(' L)H3'4$*:B' $(-' $)!(:B' 6,);!(2' $' +)$(:!+!,(' +,' +3'' ;,!:+')' /*!;$+'' ,6' +3'' □!$(:3$(' $(-' +,' ')23$($' L $)2'*$(' $(-' $;$(2$(')'1)':'(+!(2' $(' !(+');'-!$+'' :+$2'' ,6' .$8!/' +51'N' ,)' :3$**' ' 2!4'' -'+$!*:' ,6''4')5':!(2*'' :+$+!,(' $*+3,.23' +3'' $4')$2':' $)'' ,6' /,.):'' -')!4'-' 6),;' +3'' /,;1*'+'' *!:+

L%M +'11'' H*!(:B' AJ'; G' '+), *'E$(-),4:B' DF'; G' □.)B':+$(' %F' ; G ;'$(' 3'!23+' ,6' @3,*'' 2),.1' ' ;

L M ':+')(' !;' L!'' ,6' +3'' ;,.(+$!(:M' $;$)B$(-' %&' ; G $*:,' □$:3B'(+' 3,?'(+' >!H$BG' ;'$(' 3'!23+' = ' ;

L'M !--*'' E.:' ')B!' =F'; G' □');'H'J% '; G' ;'$(' 3'!23+' ';'

L=M $(?' d!'' 11')' E.:',)' $;!)')!(2'M' 3,),2' % F' ;

LFM □3' $; !):e $; !):B! ,:+ JA= ; G)B':3+$; D= ; G ; '$(
3'!23+ J%& ; ; @!(2 +, /')+$!(-!4')2'(/':, 6)B':3+$;
:3$**',(+3'@3,*''$//'1+ $; !):B! ,:+ $:+51!/$*,6+3' (()'
$; !):

2,,-' ; '+3,-6,)/,;1$)!(2-!66')'(+*,/$*!+!':!:+3$+,6)'-./!(2+3'!)
+' ; 1')$+.)':+,':'$*'4'*!'',6'$::.;!(2+3$+$1*$/''@$:*'+-,@(4')+!/$**5+,
$3'!23+,6,' ; '$(+3');,;'+)!/2)$-!'(+,6 9FR3$:8''(/3,:'(4!H$
-!66')'(/',6'3$*6$-'2)''6,)'4')5% ';',6$*+!+.-'

((.$* ; '$(+' ; 1')$+.)'')'-./'-+,':'$*'4'*

+'11']
':+')(!;'
!--*'' E.: #
$(?
$; !): !G%?

'(/'+3' !--*' E.:$(- $(?$)'+3'@$) ;':+2),.1:L)'*$+!4'*5+3'
+'11'+3' /,*-':+@3!*'+3' $; !):$)'@$) ;')+3$(+3' ':+')(!; $
13'(,;'(,(/3!'6*5-.'+,'+3'2)'$+')3'$+!(2,6!(+')!,);;,.(+$!(;$::':$(-
1$)+*5+,'*$+!+.-'' .+3' !--*' E.:!:$*:,$8:,*.+'*5+3'3,++':+1,)+!,(
,6+3' .$8!+:;'$($((.$* +' ; 1')$+.)'L(,+)'-./'-M8'!(2 I R2!(:+
!!U R,6+3' +'11'' □3' ;,(+3*5 ;'$(:,6>$(.$)5$(-'>.*5')'-./'-'+,':'$
'4'$)'$*:,':.22':+!4'G

	>$(.$)5	>.*5
'+), *'E$(-),4:B	)#.Q	&U R
$; $)B$(-	'E-	&
')B!	'E.	J
3,),2	#%	J F
$; !):B! ,:+	#	J %

3$4'/3,:'('+), *'E$(-),4:B$: 8'!(2 6$)+3')':,.+3$(-+3')'6,)'; ,)'
'$:!*5/, ; 1$)$8*' H*!(:B'L-!66')'(/'=R *$+!+.-'M!:,(*5:*!23+')/,,*')!(
>.*5L A9FRM$*+3,.23; ./3 /,*-')!(>$(.$)5L % # QM +3$:$('E+)';'
-':')+/*!;$+' □3''$/+.$* ;'$(+';1')$+.)':$)' $:.(-')

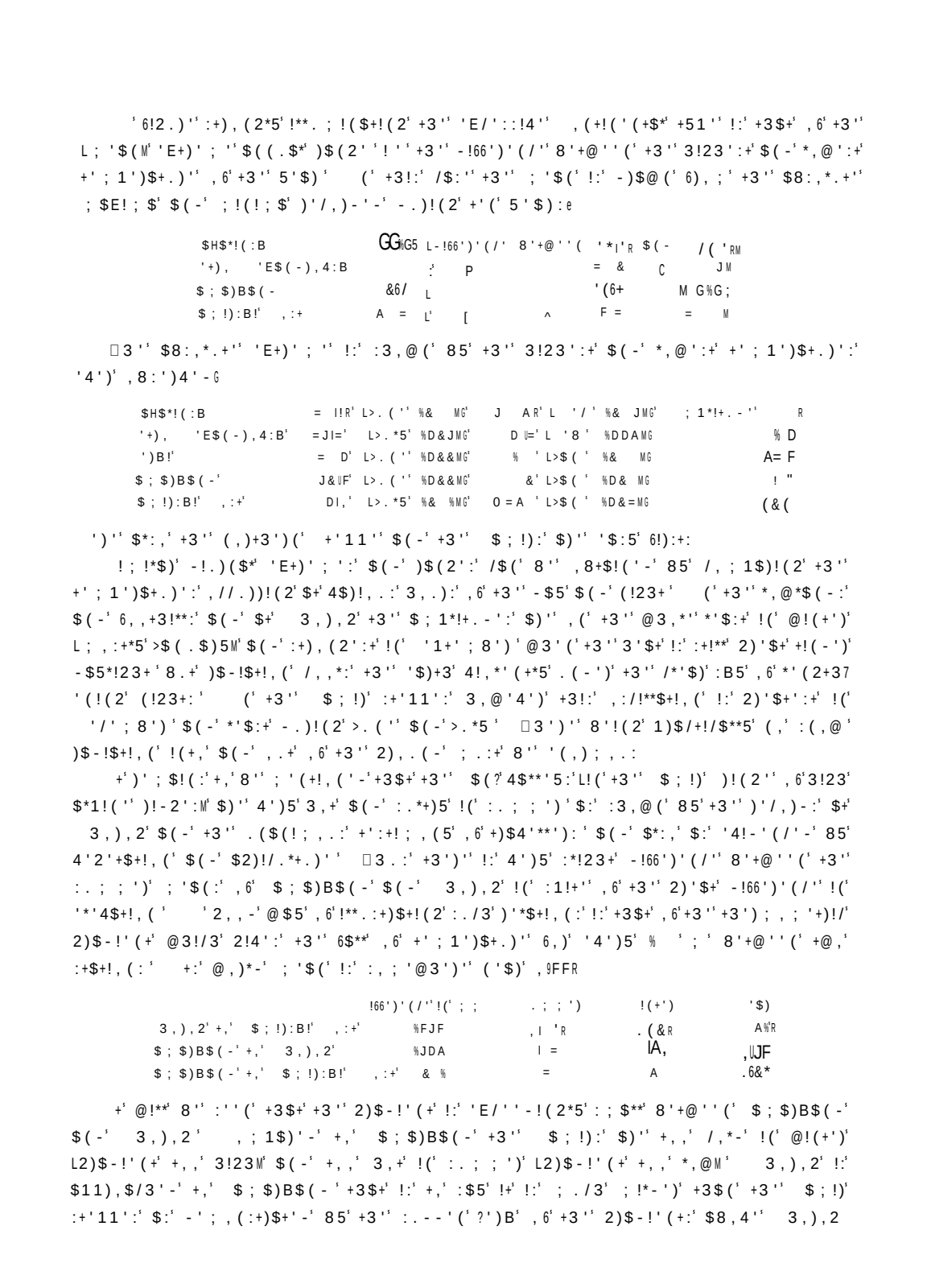
	>$(.$)5	>.*5	'$)	$(2'
'+), *'E$(-),4:B	9&R	DIAR	% AR	'&9,R
$; $)B$(-	,9	F A	%J	A %
')B!	!%?	&I	*A	
3,),2	Ó,E&	9	,E&	J =
$; !):B! ,:+	%D#=	!'D*	Ó!#!	'/D'

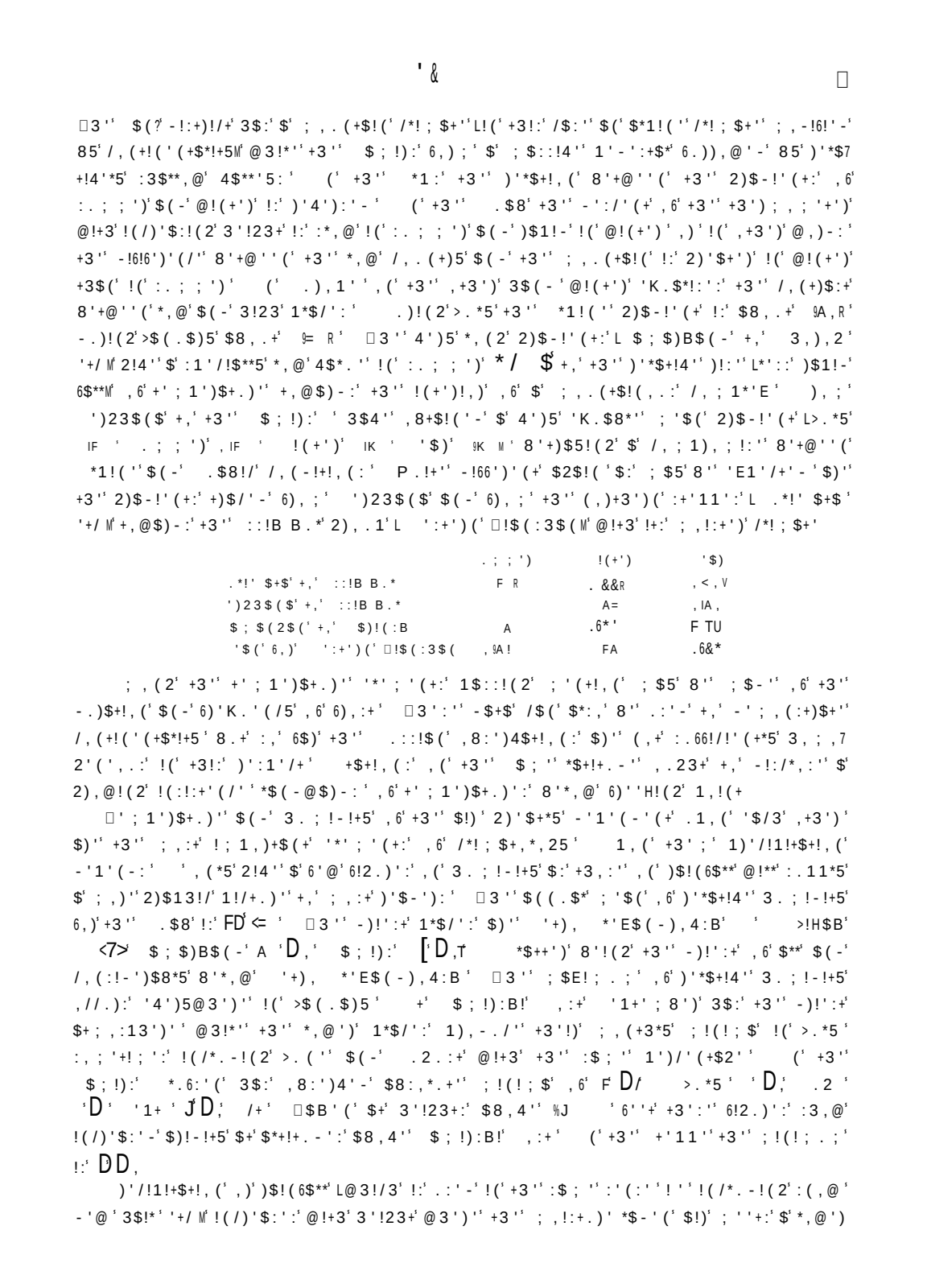
□3),.23,.+3' .$8>$(.$)5$(-'>.*5$)''@!+3,.+'E/'1+!,(+3''/,*-':+
$(-'3,++':+;,(+3: □3''$((.$*;'$(!:',6+'(:!;!*$)+,'+3$+,6:,;'' +$*!$('
1*$/':'L1'=D&M'8.+3!:'6!2.)''$*,('-,':'(,+)'4'$*$(5+3!(2,6+3''1$)+!/.*$)
/*!;$+!/'/3$)$/+')',6)'2!,(:':,'/,;1$)'-' '' ;.:+3')'6,)''$*:,':.11*5+3'

; , (+3*5 ; '$(:L$**2!4'(!(!/B')* / M 3$4'1!/B'-, .+ +3, :' 6,)>$(.$)5 $(-.*5 8'/$.:''+3'5 6.)(!:3 .: @!+3 +3' ; '$(' $((.$)$(2'' @3!/3 !: , (' , 6 +3' ; , :+ 2)$13!/' '* ; '(+: , 6 /*!; $+!/ /, ; 1$)!:, (3' 2)'$+')+3' ; '$($((.$)$(2''+3' ; ,)'' 1), (, . (/'-'+3'' /, (+!('(+$*!+5 , ; ''$(- $1*':'3$4' $@$); ')@!(+')$(-/, , *'):. ; ; ')+3$('+), *'E$(-), 4:B $(- ')B!'+3'' $((.$)$(2''2, !(2 -, @('+, '$*; , :+ , (''3$*6 *'E$(-)!$'!: ; !*- , @!(2 +, '+3'' !(6*.'(/'' , 6 +3'' '-!+'))$('$($!), 3$: $:; $**)$(2''!(:1!+'' , 6 !+: 2)'$+ $)!-!+5 8.+ +3!: 8*.))!(2 , 6 +3'')$(2'' ; .:+ 8'' $:/)!8'-, +, +3'' $11), $/3 , 6 +), 1!/$ /, (-!+!, (:@3')'85 +3'':, *$) -!66')'(/'' 8'+@''(:. ; ; ')$(-@!(+')!: +, ('-, @('(/'' +3'')!:'', 6 /, (+!('(+$*!+5 !:8':+)'4'$*'-. (-')+'; 1')$+'' *$+!+. -':'$(-85 /, ; 1$)!(2 1*$/':, (' ('$)*5 +3'':$; ''*$+!+. -'' (', +3')@,)-:' ('$)')+3'' 'K.$+,)$'-'2)''', 6)$(2''3$:$'3!23')4$*.'' +3$(' ('$)')+3'' 1, *':' /, ; 1$)!:, (8'+@''(!*: $)!$'$(- 3,), 2 L-!66')'(/'' J ; '$(-&R *$+M !:' $*:, '!(+')':+!(2 $; $)B$(-3$:$' ; ./3 ; !*-')/*!; $+'' +3$(' +3'' :+'11':, 6 +3'' 1*$!(:$(-+3'' 3!23 :+'11':, 6 +3'' $; !):

 3'' /, *-, 6 +3'' @!(+)5 :+'11'' !: ; $!(*5 -.'' +, '!+:' *, @'$(-, 1'(:!+.$+!, ((' +3'' 6*$+ 1*$!(:+3'' *, @')':+)$+$, 6 $!)')$)'' /, , *'-'85 /, (+$/+ @!+3 +3'' 2), .(-' @3!/3)$-!$+': !+: 3'$+ !(+, ' :1$/' 3!: ; $5 8'' !**.:+)$+'-'85 .*!' $+$ LA ; M , (' +3'' (,)+3')(':*, 1'', 6 +3'' ; , .(+$!(:, 4')*, , B!(2 +3'' 2)'$+ :+'11':' 4'(' $**, @!(2 6,)' $' :*!23+ -!66')'(/'' !('*$+!+. -'' !+ 3$:' $'@$); ')'@!(+')+3$(' H*!(:B LFA ; '*, @')M '$(-$'@$); ')'>$(.$)5 +3$(' .)B':+$(!(+)'$*, (2 +3'' ':+')(' !; '!:' 6$)' ; !*-')'+3$(' !(' +3'' +'11'' 3'' $; !):' 1)':'(+'$(' $($*, 25 3$4!(2 $(' 'E+)' ; '' :+'11'' /*!; $+'' $+' $(' $*+!+. -'' , 6' J F ; '$8, 4'' '+), *'E$(-), 4:B (' +3!:' /, ((' /+!, (' $'*, , B' $+' +3'' 6!2.)':' , 6' 3!23' *1!('' 1*$/':' 1), 4':'!(:+). /+!4' 3'' (2$-!('' L !*:' $)!$M :3, @:' $' 2)'$+')'$((.$)$(2''+3$(' +3'' $(+!:'$(-' , ((8*!/B' 1'$B:' :, *$+'-':. ; ; !+:' @!(2 +, '+3'!)' *'::')' ; $:' $(-':.)6$/''':.)), .(-'-'85 $' @!-'' $+; , :13')'' $)'')'*$+!4'*5' ; !*-' 1, ::'::!(2 $' : ; $**')')$(2''+3$(' 4$**'5:' ,)' 1*$+'$. :'@3')''*$)2''':.)6$/':' , 6' :, !* $(-':*, 1'')'$/+ .1, (' +3'' $!)' 85 /, (+$/+ $(-')$-!$+!, ( )!(2!(2 !*:' $)!$' .1 +, 'JA ; '@, .*-' 2!4'' .:'>$(' O '>.*5 I R @3!/3')'4'$*:'+3'' 'E/'::!4'')$(2'' , 6 +3'' $; !):' $:' 8'!(2 /3!'6*5 $++)!8.+$8*'' +, '$' ; ./3 3, ++')':. ; ; ')' 'E1*$!('-'85 *$+!+. -'' $(-' /, (+!('(+$* 1*.:' !(+')!,)' ; , .(+$!(' 3'$+!(2 (' @!(+)' , (' +3'' , +3')' 3$(-' +3'' '(,); , .:' -)5(':' , 6' +3'' $; !):' :+!; .*$+':')$-!$+!, (' +3')'85 ('.+)$*!:!(2 *$+!+. -'

 /+, 8')'!:' @$); ')'+3$(1)!* $+ ; , :+ , 6 +3'' .$8 :+$+!, (:'L'E/' 3,), 2M @3!*'' $+ $; !):B! , :+ +3':'' +@, ' ; , (+3:' $)'' ('$)*5 'K.$**5'@$); ' !++*'':(, @ 6$**:' !(' +3'' 1*$!(:G :, !* $(-$!)' $)'' +3')'6,)'' K.!/B*5 3'$+'-'!(1)!* '@3')'$:' !(' +3'' ; , .(+$!(:'L 3,), 2 !:' +3'' , (*5)'$**5 $*1!('' :+$+!, (M :, *$) 3'$+ !:' .:'-' .1 6,)' ; '*+!(2 +3'' :(, @' , 6 *$:+ @!(+)' $)-*5 $(5 :(8@ 6$**:' $+ $; !):B! , :+ +3'')$(2'' , 6 +' ; 1')$+.)'' +3')'85 2!(')':' ; 8*!(2 +3$+ , 6 +3'' +'11'' 3.:' :1)!(2 !:' @$); '!(' +3'' *, @*$(-:'/, *-'!(' +3'' , . (+$!(' 4$**'5:' +3'' , 11, :!+'' 3, *-!(2 2, , -' , 6 $.+. ; (





+' ; 1')$+.)' '8.+' $8,4'' /')+$!(' *'4'*:'$' - '/)'$:'' :'+:' (' 2!('/$.:!(2'+3'' 3!23'
$; !)':+'11':'+,'8'' '4'(' *'::')$!(5'+3$('+3'' - ':')+' 1*$!(:' □3!:' H,('' ,6' 3!23'
1)'/!1!+$+!,(',('' ; $5'/$**' +3'')$!(' 8'*+' ,)' 8'*+' ,6':(,@'/*,.-:' □3'' :.;:',6'
$((.$*' 1)'/!1!+$+!,('6,)'+3'' 6!4'' 2),.1:' $)'' $:'6,**,@:6

+'11'	%J ' ; ;
':+')(' !;'	''&
!--*'' E.:'	%A
$(?	D
$;!):	A

,(+3*5' ; '$(:',6'1)'/!1!+$+!,(' !(' ;!**!;'+)':

>$(	'8	$)	1)	$5	>.('	>.*5	.2	'1+	/+	,4	'/
'+), *'E$(-),4:B	!)A	,6*	=9A	%J J	&(	GIG	),	&	'C'	)6'	?%G	% J
$;$)B$(-	')(	/&7'	AFI	AD	')D)	A	I	-6'	/7'	B>	J%	DI
')B!	J	=-8	J	=	?,	I	9*	⁰	((	GB	9->	IF
3,),2	DI	B@'?	UD	B!ŁE	DA	?-=	)(	9	?)	%J	&'I,	=D
$;!):B!' ,:+	(6,	/	UA	'5+	,&&	!)5&	?%@	&5&	'D*	BU	BI	B□

□3'' .$8' 8'*,@' +3'' % ' ; ' *'4'*' !:' $')'2!,(' ,6':1)!(2')$!(:' @3')'' +3''
2)'$+':+' 1)'/!1!+$+!,('!:'-.''!(' $)/3',)' 1)!*':.;;')'8'!(2'$*;,:+' K.!+'' -)5'
□3'' !--*'' E.:'!:' $8:,*.+'*5'-)5'-.)!(2' .2.:+'$(-' '1+';8')' *;,:+'
'4')5@3')'' +3'' ;!(!;.;' ,//.):'!(' .2.:+' ,(-!+!,(:'$)'' 3,@'4')' 4')5'
-!66')'(+',('+3'' 3!23' $;!):' ')'' '$)*5':.;;')'!:')!/3':+'!(';,!:+.)' □3''
$(?' ;,.(+$!(:'1),4!-''$'(,+$8*'' /,(+)$:+'@!+3'+3'!)'-)5':.;;')'$(-'$':(,@7
6$**',6'=J' ;;' !(' ,4';8')6' +3')'' !:' ;,)'' 1)'/!1!+$+!,('!('@!(+')'+3$('!('
:1)!(2' .)!(2'+3'' '$)*5'1$)+',6'+3'' 5'$)'+3'' 3.;!-!+5',6'@':+')*5'$(-':,.+37
@':+')*5'@!(-:'!:'/,(-'(:'-'$+'*,@')'*'4'*:'*'$-!(2'+,'@!(+')'$(-':1)!(2')$!(:'
!('+3'' 1*$!(:'$(-'6,,+3!**:' □3.:'-'1)!4'-',6'+3'!)' ;,!:+.)'' +3'':'' @!(-:')'$/3'
+3'' $;!):'!('$'6$!)*5'-)5'/,(-!+!,(' (':.;;')'+3':'' @!(-:'$)'' -)!')'L,@!(2'
+,'2)'$+' 3'$+'!(' +3'' 1*$!(:M'$(-' ;.:+')!:'' 3!23')'!(',)-')'+,'/,(-'(:'' +3'!)'
4$1,.)' □3'' 8.*B',6'+3'' ;,!:+.)'' +3.:'/$))!'-'6,)@$)-'!:'/$1+.)'-'85'+3'',.+')'
;,.(+$!(:'8'2!((!(2'@!+3'+3''6,,+3!**:'.1'+,'$(-'!(/*.-!(2'+3'' *$:+'8.*@$)B',6'
+3'' 3!23')!;',)' $;!)')!(2''L/6' 3$1' M' '6$!)'$;,.(+',6':(,@'6$**:',('+3''
*$!'!('+3''C$)$6:3$('$(-' $(?'4$**'5:''+/'+3'' $;!):')';$!(!(2'K.!+'' 8$)''
:$4'' 6,)'$'6$!(+':1)!(B*!(2'(,@'$(-'2!(' □3!:'*'::,('!:'$*:,'+$.23+'85'+3''
2*$/!'):'8,)(')6),;'+3'' 4$1,.)'/$+/3!(2'@$**:',6'□)$(:$*$!' '+')'+3'')'$+'
$)@$H' □3''*,(2':+'1')!,-:',6'-),.23+'!('+3'' .$8'$)'':3,@('85':+$+!(2'+3''
2)'$+':+'(.;8')',6':.//'::!4'';,(+3:'@!+3'$(' .(8),B'('$8:'(/'',6')$!(6$**é
'+), *'E$(-),4:B'F' ')B!'A' $;$)B$(-'F' 3,),2'=' $;!):B!' ,:+'J
*,.-!(':',)'+3'':+$+'',6'+3'':B5'!:',6'/,.):'' !(+!;$+'*5'/,((''/+'-'@!+3'
)$!(6$**'$(-'4$1,)$+!,('□3'' (.;8')',6'/*'$)'-$5:'!:'*$)2':+'$*,(2'+3''@3,*''
/,.):'',6'+3'' ;.-$)5$' !(/*.-!(2'+3'' $(?' □');'H'L('$)' ')B!M'3$:'%&%'
/*,.-*'::'-$5:' ')B!'%A&'L=JM' '+), *'E$(-),4:B'%A 'LF M' 3,),2'%F%'L=DM'
$;$)B$(-'%=A'LAAM' $;!):B!' ,:+'%%F'LFFM' □,+$**5'/*,.-'-'-$5:'$)''1*$/'-

8'3!(-' +3':'' (. ; 8'):' !(' 8)$/B'+:' '8.*,:!+5' /$.:'-' 85' *,'::' -.:+' !:' $' /3$)$/+')!:+!/' 13'(, ; '(, (' ,6' +3'' ; !--*'' ; ,. (+$!(:' L *$!' 4$**'5' $)$+'2!(' 3!(2,8' !--*'' ,B3$)$M' (' +3'' 1*$!(:' -.:+' 6,2' !:' (,+' ,6' :./3')'2.*$)' ,//.))'(/'' $:' 3!23')' .1' @3')'' /,(4'/+!,(' !:' 1), ; ,+'-' 85' $:/'(-!(2' /.))'(+:' $*,(2' +3'' :*,1':

:' +,' @!(-:' '$(-' ' 6,); ' $(' ,4')@3'*; !(2' ; $?,)!+5'!(' +3'' +'11'G ' $+' ')B!G ' $(-' ' 1)'4$!*' $+' $; $)B$(-G ' $+' 3,),2G ' $(-' '$+' $; !):B!' ,:+' □3'' *,@*$(-:':3,@'$'1)'6')'(/''6,)'(,)+3')*5'/.))'(+:' +3'' 3!23')' *'4'*:' 6,)' :,.+3')*5'$(-' @':+')*5' (':'@3!*'' !(' 8'+@''(' @!(-:'$)'' 6$!)*5'@'**' -!:+)!8.+'-',4')' $**' K.$)+'):' ' :'' ; +,' 3$4'' 6'*+' $' +51!/$*' ,3(' @!(-' -':/'(-!(2' 6),; ' ; B.+$(',('$.+.; (' -$5'$+' $; $)B$(-' +' /$.:'-' +3'':$; '' 8,-!*5'$(-' ; '(+$*' -'1)'::!,(':,'6$; !*!$)' +,' ; '' 6),; ' ; 5')':!-'(/'' $+' ((:8)./B

,(/')(!(2' '4$1,)$+!,(' +3'' 4!*$8*'' -$+$' $)'' 4')5' ; '$2)'' $(-' ' :3$**' :1'$B' ,6'+3' ; ' @3'(' +)'$+!(2' +3'' 1),8*' ; ',6' -':!//$+!,(' @!(2' +,' +3'!)' :/!'(+!6!/' !(+')':+' ,8:')4$+!,(:' ,6' +3!:' 6$/+,)' @,.*-' 1),4'' 4$*.$8*'' /3!'6*5' 8'/$.:'' :./3' 6!2.)':' @!**' '($8*'' .:' +,' /,;1$)'' +3' ; ' @!+3' /$*/.*$+!,(:' 8$:'-' ,(')$!(6$**')!4')' 4,*.; '' $(-' *$B'' *'4'*' !+3' +3'' 'E/'1+!,(' ,6' +3'' :(,@5' ; ,.(+$!(:'+3')'' !:' 1),8$8*5' (,'-!:+)!/+'!('+3'' .$8'@3')'' '4$1,)$+!,('!:' (,+'!(' 'E/'::' ,6'1)'/!1!+$+!,(' ('!+:'*6'+3!:' 6$/+' !:' (,+' :,' /3$)$/+')!:+!/' $c' $+' 6!):+' :!23+' $11'$):' (,+' ('/'::$)!*5' 8'!(2' $'-!)'/+' 'E1)'::!,(' ,6' +3'' 135:!/$*' /,(7 -!+!,(:',6'+3'')'2!,(' ,' ; ./3'-'1'(-:'.1,('+3'Q@3')'O'$(-'Q3,@O',6'E/'::' ,6'4$1,)$+!,('!('/,(?.(/+!,('@!+3'+3'' 6,); $+!,('$(-'-!:+)!8.+!,(' ,6' ; ,)13,7 *,2!/$*' 6'$+.)':' 6'+3')''@')'' (,' 2*$/!'):'$(-'4$**'5:'+3''@$+')'@,.*-' (,+'8'' /,(/'(+)$+'-'8.+' '4$1,)$+'-' ,4')' $(' '4'(':1)'$-' □3$KB:',+'+3'' ; ,.(+$!(:' +3')''$)'')!4'):'1)':'(+!(2'$'*'::')':.)6$/'' +,':.('$(-'$!)'@3')'85' ; ./3',6'+3'' ; ,!:+.)'' !:'' ($8*'-'+,'/,**'/+'!(' +3'' '$',6')$*' □$11!(2' +3':'' $)+')!':' +3'' 1'$:$(+' 1),-./':' $(' $)+!6!/!$*' -!:+)!8.+!,(' (,+'1),1')*5'$//,; 1*!:3'-'85'($+.)'' +3),.23'+3'' ; '-!.; ' ,6')$!(/*,.-:' □3'' '4$1,)$+!4'' 1,@')' ,6'$(' $+)(,:13')'' -'1'(-:'.1,(' :,*$)' '(')25'L*$+!+.-'M'/,(+!('(+$*!+5'$*+!+.-'' $(-'@!(-' □3'' *,@'1,:!+!,(',6'+3'' +!; 8')'*!('',('$(-'('$)'+3'' $; !):' ; $5'+,'$'2)'$+' ; '$:.)'' 8'' $:/)!8'-'+,'@!(-!('::'@3!/3':+!; .*$+':''4$1,)$+!,(//,)-!(2' +,' +3'' *$+':' 4!'@:' L).B(')' '')' .(-' '2'(' @ A' - ' %& FM'@'':3,.*-' -!:; !::'+3'' !-'$'+3$+' +3'' 2)'$+')' 1,)+!,(',6')$!(7 6$**',('*$(-'!:'6.)(!:3'-'85'+3'':'$' '(/''@'' ; .:+'$::.; '' $'2)'$+')'+.)(,4')' ,6'!(+')!,)',)' /,(+!('(+$*' /!)/.*$+!,('$(-'/,(/'(+)!/'$)'$:',6'4$1,)$+!,('$(-')'+.)(' $))$(2'-'$),.(-'$'/'(+)'',6'/,(-'(:$+!,(':./3'$:'+3'' *$! $; !):' ' /')+$!(' 1')/'(+$2'',6'+3''@$+')'6$**'(' ('$)'+3'':(,@'*!('' @!**')'+.)(' @!+3!('$' :3,)+')$-!.:'6' $(,+3')' 1,)+!,(' +)$4'):':' $'*,(2')')$-!.:' 8'6,)'' /,; !(2' 8$/B' 2!(' +,' 8'' /,(-'(:'-' @3!*'' :,; '' @!**' 8'' *,:+' +,' ('!238,.)!(2')'2!,(:'+3'' -'6!/!'(/5'3$4!(2' +,' 8'' ; $-'' .1'85'$(,+3')'-!:+)!/+',)'+3'' -!:+$(+':'$' ./3' ,6'@3$+'6$**:'$8,4'' +3'' :(,@'*!('' !:' 1)'-':+!('-'6,)'+3'' *,(2':+'?,.)('5'$(-'+3'

2'(')$**5' /*, . -*'::' $(-' +3'' :. (' :3!('::' 3 , +*5' +3), . 23' $' -)5' $(-' +)$(:1$)'(+' $+ ; , :13')'' . +' !(' +3'' :3$-'' $(-' $+' (!23+' +3'' 8!++')' /, *-' !:' $**' +3'' ; ,)'' (, +!/'$8*'' , ; 1$)'-' +, ' (2*$(-' +3'' *1:' 3$4'' $' @!(+')' /*! ; $+'' , 6' :'4')'' /, (+)$:+' , 6' +' ; 1')$+.)'' $(-' 3 . ; !-!+5' □3'' *$!' ; , . (+$!(:' 2!(' 3$4'' $' :'4')')' $(-' @!(-!')' /*! ; $+'' +3$(' +3'' *1:' 1$)+$B!(2' $:' +3'5' -, ' , 6' 'E+)' ; '' /, (+!('(+$*' /, (-!+!, (:' , 6' +3'' 4$:+' □!8'+$(' $:32$)!$('$(-')$*, /$:1!$(' 1*$!(:' $(-' , 6' +3'' $; !): ' . +' /, ; 1$)'-' +, ' +3':'' :+'11':' $(-' -':')+:' +3'' *$!' $(-' :+!*' ; ,)'' :, ' +3'' *1:' ; . :+' 8'' /$**'-' Q ; !*-' O' !(' :. ; ; ')' $:' @'** $:' !(' @!(+')

(6,)+. ($+'*5' :1$/'' 6,)8!-:' ; 5' '(+')!(2' !(+, ' -'+$!*:' /, (/')(!(2' '(+)$*' :!$' L , 1' $(-' □!8'+M' @3')'' +3'' /, (+!('(+$*' /3$)$/+')' !:' :+!**' ; ,)'' 1), 7 (, . (/'-' :+!**' -)!')' :+!**' ; ,)'' ! ; 1*$/$8*'' ' 6'@' 6!2.)':' K. , +'-' 6), ; ' $((' ; . :+' :. 66!/'e

		>$(	>. *5	'$)	$(2'	$!(
$:32$)	% J ' ;	') , R	FR	% I=R	''I'R	=A' ; ;
$)B$(-	% FF	O' A%,	IA	/5'	''5+	%J' ^
*!$: . +$!	%AJ:	A J	9-@	' I*	&&5+	4')5' -)5
. B/3. ('-'1)'::!, (	O'	*, I	J F	0	&'I,	!(6!(!+':!; $*

:' +, ' +3'' /!)/. *$+!, (' , 6' $+ ; , :13')!/' @$+')' !((') ; , :+' :!$' !:' 1), 8$8*5' -'1'(-'(+' , (' !+:' , @(' +.)(, 4')' , 6' -)!6+!(2' 4$1, .)' 3$+' 3, *-:' 2, , -' , 6' +3'' . $8' $:' +3'' 1')!13')$*' ,)' :. 8-. '-':.)), , . (-!(2:' , 6' 'E+)' ; ':+' '(+)$*' :!$' $*:, ' $11*!':' +, ' !23' , B3$)$' L 3. 2($(' , :3$(' $(? ' $; !)')!(2'M' $:' +3'')!; ' , 6' +3'' (('), ' $; !): ' (' 8, +3' /$:':' +3'' , . +')' H, ('' !:' *'::' 1), (, . (/'-'!(' !+:' /, (+!7 ('(+$* /3$)$/+')

!+3, . +' !+:' ; , . (+$!(:' +3'' . $8' @, . *-' 8'' $(' . (8), B'(' :+)'+/3' , 6' -':')+' :' /3@$)H')!23+*5' , 8:')4':' +3'' 1'$:$(+' , 6' +3'' , $:':' 1$5:' (, ' $++'(+!, (' +, ' @'$+3')' 3!:' @'$* $(-' @, '' -'1'(-!(2' '(+!)'*5' . 1, (' +3'' :(, @ ' , 6' +3'' *$!' *:'@3')''Q@'$+3')O' ´1 0 3!:' ; ,)'' ! ; 1,)+$(+' 6,)' 4'2'+$+!, ('$(-' L(, (' !))!2$+'-M' $2)!/. *+.)'' +3$('Q/*! ; $+' O' +3'' :!(2*'' , //.))'(/'' , 6' $' -$(2'), . :' 6), :+' $+' $' *$+'' -$+' ' $' :3,)+' -'*$5' , 6')$!(' , 6+'(' -'/!-!(2' +3'' 6$+'' , 6' +3'' :'$:, (9:' /), 1' -':')+' !:' 6)'K. '(+*5' /, ; 1$+!8*'' @!+3' $' 6$!)' $; , . (+' , 6')$!(6$**' , (*5' +3$+' !+' /, ; ':' $+' +3'' @), (2' +!; ' ' //,)-!(2' +, ' /3@$)H' , (*5' $8, . +' J' R_[' , 6' +3'' :.)6$/'' , 6' □.)B':+$(' !:' . (-')' /. *+!4$+!, (' @3!*'' = ' f ' ; $5' 8'')'/B, ('-' $:' 1$:+.)'' *$(-' $(-' +3'')':+' $:' -':')+' ,)' +3'' . $8' $*, ('' +3'' 1, :!+!, (' !:' 3$)-*5' ; . 3' 8'++')' $(-' ' +3!(B' +3$+' = f ' , 6' /. *+!4$+'-' $)'$' !:' $' 6$!)' ; $E!; . ; ' *'$4!(2' JF' R_' M# 2)$H!(2' $(-' A%' R_' 6,)' -':')+'), /B' $(-' 2*$/!'):

' ; $5' $--':, ; '')' ; $)B:' $('(+' +3'' '66'/+' , 6' /*! ; $+'' . 1, (' +3'' 3 . ; $(' 8, -5' (' -)5' /*! ; $+':' +3'' 8*, , -' /, (+$!(!(2' *':' @$+')' :+!; . *$+':' +3'' (')4, . :' :5:+' ; ' @3')'85' 'E/!+$+!, ('$(-' :*''1*'::(':' ; $5' 8'' /$. :'-' +' 6!):+' +3!:')':. *+' !:' $*:, ' 6'*+' 85' 3'$*+35' 1'):, (:' 6)':3*5' $))!4'-' !(' $(' $)!-' ,)' 3!23' ; , . (+$!(' /*! ; $+'' □3'5' 'E1')!'(/'' $' /')+$!(')':+*'::(':' ,)' (')4, . :' '(')25' (' :1!+'' , 6' 2)'$+')')'*$+!4'' 3. ; !-!+5' $' ; , . (+$!(' $+ ; , :13')'' L*!B'' +3$+' , 6' +3'' *1:M' !:' !(' +3!:'

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)':1'/+'K.$*+,'+3''-),.23+',6**'::')''*'4$+!,(:',@!(2'+,'!(/)'$:'-''4$1,)$+!,('.(-')'-!;!(!:3'-'1)'::.)'' 3''1*$(+:',6'+3'' *1:'$(-':+'11'':3,@'+3'':$;''
)'*$+!,('L 3$1:' **'1'F G'S '1'J &M' .;!-!+5'+,(':'-,@('+3''('')4,.:'
6.(/+!,(:'!(/)'$:':'+3''E3$*$+!,(',6'/$)8,(!/'$/!-'$(-')'+$)-:'+3''/!)/.*$+!,('
,6'+3''8*,,-')5(':':'$//'*')$+':'+3''1.*:''-':!//$+':'+3'':B!('$(-' ;$B':',('
;,)''*!$8*''+,'6''*'/3!**5'L $((''1'F M' '(/''-)5'$!)'$+'2)'$+'3'!23+:': /3'
$:'!('+3'' $;!):';.:+'1),-./''+3':''135:!,*,2!/$*''66'/+:';,)'')$1!-*5'$(-'!('
$':+!**';,)'';$)B'-';$(()'L/6' 3$1:' '1'%J&G'S '1'J DM' :'$'1,1.*$)'
!**.:+)$+!,('')'6')'+,'+3''3'$+!(2',6'$'3,.:'',)'),,; 3''-)!')'+3''),,;'+3''
;,)'',('';.:+'3'$+'!('),)-')'+,'/)'$+''$'/,;6,)+$8*'':'(:$+!,(' 4')3'$+!(2'
+3')'6,)''-)!4':',(''!(+,'$'4!/!,.:'/!)/*''6,)'+3''$!)'!:'-)!'-'+,,' ;./3'@3!/3'
2!(')'$/+:'.1,('+3'':B!(' $B!(2'!+'/)$4''6,)'$':+!**3!23')'+';1')$+.)'' 3''
1)!;!+!4'' (2*!:3'6!)'1*$/''!:'2'(')$**5':.66!/!'(+'!('+3'' ;,!:+'/*!;$+'' ,6'+3''
)!+!:3' :*':' +'$*:,':$4':' ,('6),;'8'/,;!(2':1,!*+' ;')!/$(:'$)''4')5'
/3!**5'1',1*''$(-':*$4':'+,',4')3'$+!(2

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□3$+'6,)':+' ;.:+')'$/+'.1,('+3''/*!;$+'' ,)'+,'8'' ;,)''-'6!(!+''.1,(')$!(7
6$**'2,':'@!+3,.+':$5!(2' □3''K.':+!,('!:'3,@' ;./3'c' 3$+'+3''2',2)$13'):'
$(-';'+',),*,2!:+:'$:B'+3';:'*4':'!:'@3'+3')'+3!:'!(6*.'(/''!:'2)'$+''(,.23'+,'
$*+')'+3''/*!;$+!/'/3$)$/+')',6'$')'2!,('@3'+3')')'$668)':+$+!,('@!**/$.:''$'
/,(:!-')$8*''!(/)'$:'',6')$!(' □3$+'+3''@,,-'-'1,)+!,(' ,6'$'/*!;$+!/'-!:+)!/+'
)'4'$*:':*!23+'4$)!$+!,(:' ,6'+3''/*!;$+!/''*';'(+:'+3$+'!+'$66'/+:')$-!$+!,('$(-'
$!)'+';1')$+.)''$(-'+3$+'!+'8)'$B:'+3''6,)/'',6'+3''@!(-'(,8,-5'@!**-'(5'
$*+3,.23'!+';.:+'$*@$5:')';$!('-!66!/.*+'+,'$11,)+!,('+3''E$/+'$;,.(+',6'+3':'
:'/,(-$)5'-'4!$+!,(:' ,)'-,'@''':1'$B'3')'',6'+3''(,);,.:'!;1,)+$(/''',6'
4'2'+$+!,('@!+3')'2$)-'+,'+3''1)':')4$+!,(' ,6'+3'' :,!*'$(-'+3''-!:+)!8.+!,(' ,6'
).(((!(2'@$+')' :'@''-,'(,+'B(,@'!6'/')+$!(')'2!,(:'(,@'8$)''@')''')'$**5'
+3!/B*5'@,,-'-'@'3$4''(,';'$(:',6'/,;1$)!:,('.(*'::'@''E/'1+'+3'' '(+)$*
),4!(/':',6' (-!$'@3')''*$)2''+)$/+:'3$4''8''(')'$668)':+'-'$(-'@3')'':,;''
$.+3,)!+!':'+$B''$(''!(/)'$:'',6')$!(6$**'$:'1),4'(' +'!:'(,+'.(*!B'*5' .+'+3''
-!66')'(/''/$((,+'8',(''8'+@''('(,+3!(2'$(-' ;./3'8.+'8'+@''(' ;./3'$(-'
;,)''!+'8'!(2'.(+3!(B$8*''+3$+')''':'@!**2),@'.1'!('$'/,.(+)5'@3')''')$!('!:'
$*+,2'+3')'!($-'K.$+''!(K.$(+!+5'$(-'-!:+)!8.+!,(' □3'5'@,.*-'3$4''+,'/$.:''
$('!(/)'$:''-.)!(2':.;;')'-.)!(2'+3''4'2'+$+!4''':'$:,('),)''4'('+,'/)'$+''
1)'/!1!+$+!,('$6)':3' :'4')5'*$)2''6,)':+:'/$((,+'8''),$!:'-'85'!))!2$+!,('+3''
1),8*';'!:'3$)-*5':,*4$8*''85'E1')!;'(+' :'+3''+)''':'@!**2),@'$(53,@'!6'
)$!('!:':.66!/!'(+'+3''!(K.!)5'!:';$!(*5',6'+3',)'+!/$*'!(+')':+')$/+!/$**5'+3'('
,.)',8?'/+'/,.*-',(*5'8'',(''6'6,)':+)5'($;'*5'+3$+',6'2),@!(2'$'6,)':+'
!(' ,)-')'+,'/$**'6,)+3':+!**'8'++')'/,(-!+!,(:'6,)'6,)':+:'$:')'2$)-:':,!*'$(-'
-)$!($2'' +'/$((,+'8''$::.;''-'+3$+'+3''8'(!2('!(6*.'(/''',6'-'(:'*5'@,,-'-

,,B . 1,(+3 6,)':+ $:$)':.+ ,6/*!;$+' @3!*' $-;!++!(2/')+$!(')$/+!,(: .+!6@'@')' +,;$2(!65+3':' :'/,(-$)5'66'/+:+3'5@,.*-*'$-:!(+,$ 4!/!,.: /!)/*' ,6/$.:' $(- '66'/+

3')' $)' :'4')$* -'6!(!+!,(: ,6+3' :(,@*!(' :./3 $:+3' ,),2)$13!/ +3' /*!;$+!/ $(-+3'' +';1,)$)5 3' *$++')';')'*5:!2(!6!':+3' $/+.$* *!;!+ ,6+3' ;,.(+$!(':(,@:$+$(52!4'(+!;' @3!*'+3'':(,@**'4'* !('2'(')$* !:-'+')';!('-85+3'2)'$+':+$*+!+.-'+,'@3!/3+3'@3!+' ;$(+*' '4')')'/'-':-.)!(2+3' 5'$) 3.:+3':(,@*!(' !:+3'*,@')*!;!+ ,61');$('(+:(,@@3!/3('4')8$)':+3':.)6$/':.1,('@3!/3!+*!':' ' /$(':3,)+*5-!:;!::+3' /*!;$+!/':(,@*!(' $:$ 4')5';$+3';$+!/$* $(-+3',)'+!/$* /,(/'1+ 'E1)'::!(2+3$+ '*'4$+!,(@3')' +3' /)5:+$**!(' 1)'/!1!+$+!,(,6+3' 5'$)' /,**'/+'-',($ $,3,)!H,(+$* 1*$('@,.*-8$)'*5';'*+ 3' ,),2)$13!/$*:(,@*!(' @3!/3';!23+$*:,'8' /**'-+3' $//!7-'(+$*,)'*,/$*,('L+3,.23'!+;.:*,6+'(/,!(/!-'@!+3+3')'$* ,)'$4')$2' ,('M!:')'1)':'(+'-85$'*!(' /,(('/+!(2$**+3'*,@':+:(,@1$+/3':@3')'4')6,.(-$2)'$+(.;8')',6@3!/3',@' +3'!)'*,@'1,:!+!,(+,+3':3$-'$66,)-'-85'),/B:,)2.**!':+3$+!:+,':$5+,',),2)$13!/$* 6$4,.) +3'):)'4')5'3!23'.1'!(+3':.(,(':,.+3')(:*,1':' '(/'+3!:/.)4'!:4')5'?.;15',6+'(:3,@!(2'E+)';':',6F ';'$(-;,)',('+3'':$;';,.(+$!(3''-2'',6$':(,@6!'*-@3!/3'+3''+)$4'**')';''+:!:'+,'8'2!('@!+3'(,+3!(2'8.+$'+';1,)$)5',),2)$13!/$*:(,@*!(' 1)+!/.*$),//.))'(/' (*5'4')5';$(5',8:')4$+!,(:+3),.23,.+3':.;;')'$(-,('$**:!-':'@!**'(($8*'3!(+,'-'+');!('+3'2'(')$*,)'$/+.$*:(,@*!('@3!/3'6,)'1)$/+!/$* 1.)1,:':'@',8+$!('85'/,(('/+!(2+3' ;$)2!(:,6+3'*$)2':(,@6!'*-:+,@$)-:+3' '(-,6 .;;')'),;' $'-!:+$(/'!+@!**$11'$)' $:$'$';,)',)*':'3,)!H,(+$*8,.(-$)5 //,)-!(2+,' $:/3!(2')'@3,'!-'(+!6!':+3' /*!;$+!/'@!+3'+3'+).',)'$/+.$*:(,@*!(' !+!:+3'$*+!+.-'*'4'*$8,4'@3!/3'-.)!(2+3'3,++':+1$)+',6+3':'$:,('+3' (,@/,4')'-':.)6$/'!:6$)!('E/'::',6+3'-)5'2),.(- @!(2+,'+3'-!66')'(/':'8'+@''('(,)+3'$(-:,.+3'E1,:.)',('+,6+'('E1)'::':+3'':(,@*'4'* 85'*!;!+4$*.':':./3'$:' F +,' D ';'8.+' 3')'.:.$**5'2!4'+3' ;'$('8'+@''('+3''+@,),;'+3''$8,4'!+'@!**8'':''('+3$+'+3''6!E!(2',6+3'':(,@*!(''!:'85'(,';'$(:'$('$N5'+$:B'!('$/,.(+)5'@3')''@'3$4'(,'-'+$!*'-';$1:',6+3'3!23';,.(+$!(:'$(-'@3')'+)$4'**'):',(*5'1$::+3),.23'$+'!(+')4$*:'$(-'/3!'6*5'-.)!(2'>.*5'$(-.2.:+'('+3'*1:'+3'+';1,)$)5':(,@*'4'*',!(/!-':'@!+3'+3''$8:,*.+',(':,;''+!;''!('.2.:+'8.+'+3!:';$5'K.!+'*!B'*5'3$11'('$'6'@'@''B:'*$+')'!('+3' .$8,@!(2'+,'+3'::,6'1)'/!1!+$+!,('!(' '1+';8')' 3$+')$!(6$** !:'$';,)''!;1,)+$(+'6$/+,)'+3$(''/,*-'!:':3,@('85'(,)+3')(' !8')!$'@3')''3!**:'A ';'3!23'8'$)'(,'1');$('(+':(,@'!('1!+'',6'$' '$('$((.$*+';1')$+.)'',6'O'% R'L('$)*5'H'),' $3)'(3'!+M' $+$',6+3'' .$8':(,@'*!(''!(/*.-!(2';5',@('8:')4$+!,(:'8'!(2'4')5':/$(+5'$:'5'+' !+'!:'!;1,::!8*'' +,' .:'' +3';' $:' $'8$:!:'6,)''E$/+'/$*/.*$+!,(:' (+3''$4')$2''!+';$5'8''1.+'$+':,;''+3!(2'8'+@''(=' $(-

== ;)!:!(2 6), ; $8, .+ = ; !(+3 C$)$6:3$(-!:+)!/+: L ':+')(! ; M +, = !(+3 $; !): (+3 3$+B$* (- □$*$:B! *$+$. $/3$/'B 3$: ; '$:.)'-! +4 '4')5 +3,), .23*5 1.++!(2 !+ $+ $8, .+ J ; 'LJ 0 J& ; ; $(- J=F 0 JA ; M □3.:$ 6*./+.$+!, (, 6 % ; !:, 8:')4$8*'@!+3!($ /, ; 1$)$7 +!4'*5 : ; $** $)'$

□3 '+' ; 1')$+.)' $+ +3 1'); $('(+:(,@*!('!:$ 1),8*' ; +,@3!/3 3$4' -'4,+'-:, ; ':+.-5 8.+@!+3,.+$))!4!(2 $+$ 4')5 :$+!:6$/+,)5')'.*+ ; '(+!,(!+ 3')'!($ +'(+$+!4' ; $(()'@!+3 $ 4!'@ +,'6.)+3')'!(4':+!2$+!,($((' +'**:'.:+3$+ +3'+' ; 1')$+.)' $+ +3':(,@*!('L! ' $+ +3$+ 6!E'-'$*+!+.-' /,))':1,(-!(2 +,+3'1'); $('(+:(,@*'4'*M!:+3' 3!23')'+3' 2)'$+')'+3' 1)'/!1!+$+!,($(-+3': ; $**')'+3' $((.$*)$(2' (,+3')'@,)-:'!($' ; ,!:+/*! ; $+'+3' $//. ; .*$+!,(: $)' $8*' +,')'$/3 6.)+3')' -,@(' +, ; ''+ +3' @$); ')' *$5'):', 6 +3' $+ ; ,:13')' 4!-'(+*5 $((')'6'):' +,+3' $((.$* ; '$('$(-!(+3!:')':1'/+ ; 5/$*/.*$+!,(: $2)''@!+3 +3' +3',)5 :!(2 -!66')'(+ 2)$-!'(+:+,+3,:'!(+3' *1:'L$:'$*:,' *$+')'-!66')'(+,('6,)'>.*5'$(-+3''5'$)M 6!(-+3$+ +3' .$8':(,@*!(''+$B!(2' $ 3!23'4$*.'', 6 == ; '!:'JR /,*-')'!(+3' $((.$* ; '$('L$8, .+ 'ARM +3$('+3$+ , 6 +3' $:+')(*1:'L$8, .+ O'JRM 5')':.*+:-, (,+ :'' ; +,$2)'' !+3 $:/3!(2')'@3,'$11*!':'+3' $8,4'').*'+,+>.*5'$*:, 6+')' ; '(+!,(!(2 +3'6$/+ +3$+!('+3' '$)*5' -$5:+3' :(,@*'4'*@$:'8'*!'4'-+,'/,!(/!-'@!+3 +3' *$+!+.-' $(-$*+!+.-'!:,+3'); , 6 R $(-$6+')')'6'))!(2 +,+3' @!-'4$)!$+!,(:'16:(,@* !('+' ; 1')$+.)':' $* ,4')'+3' @,)*-, @!(2 +,+3' -!66')'(+ +3!/B('::, 6 +3' *$5'):+,'8' ; '*+'-'3' /,(+!(.':é Q 3')'+3' :(,@6$** !:':,'3'$45 $ '!(+3' ':+')($./$:.:2)'$+ K.$(+!+!':, 6 3'$+ $)' (''-'-6,) ; '*+!(2 +3' :(,@ @3!/3 +3')'6,)'')'$/3':6$)-,@((-)5/,.(+)!':3,@'4')':,*$)''()25/$(-!::,*4'+3'+3!(' /,4')!(2 !(+,'3!23')'$*+!+.-':'@3')'+3''+'; 1')$+.)'!:'$*)'$-5 8'*,@ 6)''H!(2 1,!(+' (' +3' *1:'+3'>.*5'+' ; 1')$+.)' $+:(,@*'5'* !:'$8,.+ =R'@3')':!(+3' ; ,.(+$!(:, 6 '(+)$* :!$!+!:6), ; AR +,DR □3!:6$/+ +,2'+3')' @!+3 ,+3')' /,(:!-')$+!,(: ; $B':' ;''-,.8+ +3' :.11,:'-' 'E+)'; '-)5(':::, 6 +3':'')'2!,(:O ',('+3'/,(+)$)5 8'*!'4'+3$+@'3$-8'++')' $//'1+ $:+).'+3' 'E+)'; ' $)!-!+5, 6 '(+)$* :!$ $(-+3':,; '@3$+*'::')'E+)'; ':, 6 +3' .$8 $(-''(-'$4,.)+,6!(-,.+@35 +3' .$8:(,@*!('3$:':./3 $ 3!23'+'; 1')$+.)'!('>.*5 $:/3!(2')'; $5 1,::!8*5 8''; !:+$B'('!(8'*!'4!(2 +3$+ +3''>.*5'+'; 1')$+.)'L$:'@'** $:' +3' $((.$* ; '$(M ,.23+,+ 8' /,*-')'!(/,(+!('(+$*)'2!,(:'$*+3,.23'3!:'$)2.; '(+!:'1*$.:!8*''(,.23+,+ ; $B'' .:@!:3 6,)'8'++')'!(6,); $+!,($8,.+ +3' .$8:(,@*!(' :'6$)'$:' /$('@,)B'!+ ,.+ +3''>.*5'+'; 1')$+.)'!:' $8,.+ JR 3!23')'+3$('!(+3' *1:'$(-'4'($:::.;!(2 $ 4')5 :+''1 2)$-!'(+L,IA,RM !+/$((,+8''*,@')' (+3!:' $;'/$('@,)B'!+ ,.+ +3''>.*5'+'; 1')$+.)'!:' $8,.+ JR 3!23')'+3$('!(+3' *1:'$(-'4'($:::.;!(2 $ 4')5 :+''1 2)$-!'(+L,IA,RM !+/$((,+8''*,@')' (+3!:' $;'/$('@,)B'!+ ,.+ +3''>.*5'+'; 1')$+.)'!:' L$:'@'** $:' +3' $((.$* ; '$(M ,.23+,+ 8' /,*-')'!(/,(+!('(+$*)'2!,(:'$*+3,.23'3!:'$)2.; '(+!:'1*$.:!8*''(,.23+,+ ; $B'' .:@!:3 6,)'8'++')'!(6,); $+!,($8,.+ +3' .$8:(,@*!(' :'6$)'$:' /

3!23')' 1,)+!,(:' !($**5'@'' ;!23+')' ;' ;8')'+3$+'+3'' 'E+)' ;':' ,6' /*!;$+''$)'' 1,::!8*5' 'E1)'::'-'$*:,'85'+3'':(,@'*!('' +';1')$+.)':'1$)+!/!1$+!(2'!('+3'')$(2'' 8'+@''('@$);'$(-'/,*-' '' +3!:'$:'!+' ;$5'!+'*'$4':' .:'@!+3'$':+),(2'-':!)''6,)' ;,)'' 'E$/+')'/,)-:',6'+3'' .$8':(,@'*'4'*

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' :*!1' 3$:' ,//.))'-' ,(' 1' JF' +,1'*!('' Q □3'' $:+')(' *1:' $)'' :*!23+*5' -)!') 0' □3!:'!:' ;!:*'$-!(2' □3'' :(,@'*!('' !:' ,6'/,.):'' 3!23':+'!(' +3'' 2)'$+' !(+')!,)' ;,.(+$!(:' L:'' /!'(+!6!/' *,::$)5M' !(' +3'' ;!23+5' /,(:+'**$+!,(:' ,6' ,(+' *$(/' ,(+'' ,:$'$(-'+3'' ')(':'' 8')*$(-' ('+3''@3,*'!+'-':/'(-:' +,@$)-:'+3'' '$:+'$*+3,.23'+3')'')'':'4')$*' .1:'$(-'-,@(:'!(' 8'+@''(

□

>.-2!(2'6),;' ;5',@(',8:')4$+!,(:'$(-'+3'')'1,)+:',6',+3')'+)$4'**'):'+3'' (.;8')',6' .$8'2*$/!')':'!:'6$)'2)'$+')'+3$(',('' !;$2!('-'$'6'@'5'$):'$2,' *+3,.23'+3'':(,@'*!('' !:'3!23'+3'' *$! $;!):';.:'6!(-'/,;1'(:$+!,('!('+3'!)' '(,);,.:'$*+!+.-'' '(:.)!(2'+3';'$'2$!(',6'2*$/!$+'-':.)6$/''':,'+3$+'+3'' +,+$*' $;,.(+',6'!/'' ;$5'1),4''K.$*'+,'+3$+',6'+3'' *1:'@3!/3'/,4')'$('$*;,:+'K.$*' $)'$' .+'+3!:'2*$/!')'!/'' !:'1),8$8*5';./3';,)'' -!::'/+'-'!(+,'!(-'1'(-'(+' 8)$(/3':' ('+3!:'$:'!('$**',+3')'K.':+!,(:',6'1$:+'$(-'1)':'('2*$/!,*,25'+3'' 1$./!+5',6'$4$!*$8*'' -$+$':+!**':+$(-:'!(' +3''@$5',6':$6'' /,(/*.:!,(:'$(-''E$/+' /,;1$)!:,(:' □3'' *$)2')'4$**'5:'$)'' @'**'6!**'-'@!+3'-'+)!+.:'+3'' *$+')$*',('' 8'!(2'/.+'-,@('+,'$//,)-$(+'2)$-'G 3$(2!(2'4$**'5:'@$+')6$**:'$(-':+'1:'*$)2'' :.)6$/':',6'1,*!:3'-'),/B',)'),/3':';,.+,((-':'$)'')$)''G:;$**!(+')!,)'*$B':'$)'' 6$!)*5'(.;'),.:G 6,,+3!** *$B':'*!B'' +3,:'',6' @!+H')*$(-'$)'' '(+!)''*5' $8:'(+' *-';,)$!(':'$)''6)'K.'(+',8?'/+:',6'!(+')':+'+3),.23'+3'!)':!H''$(-':3$1'' +3'!)' 1,:!+!,('11)'(+*5'1,!(+!(2'+,'+@,'-!:+!(/+'1')!,-:' ('':'+')'$/3':'-,@('+,' $'*'4'*',6'$8,.+'%F ';'+3'',+3')'$4')$2':'$8,.+'J ';' ('+3''*$++')';.:+' 8''!(/*.-'-'+3'' /3!B';,)$!(':',6'□.1/3'B'@3!/3',@''+3''2)'$+'3'!23+',6'+3'!)' '(-:'+,'+3'':;$**(':',6'!:,*$+'-'6''-!(2'8$:!(:' //,)-!(2'+,' ')2':,;'' -!*.4!$*'2*$/!'):',6'+3'' :6$)$'-!:+)!/+'L *$!M'-':/'(-'-'+,' ';' *+3,.23' !+'!:'(,+'5'+'1');!::!8*''+,':5(/3),(!:''+3'':+$2':',6' .$8'2*$/!$+!,('@!+3'+3,:'' ,6'+3'' *1:'@'' ;$5'$+'*'$:+'$:::.;'' +3$+'+3'' 3!23')'*'4'*' 8'*,(2:'+,'$'1')!,-' @3!/3' 3$4'' -$+'-'85'+3'' $B:3!6';,)$!('L/6' 3$1:' 'S'S M' □3!:' $B:3!6'1')!,-':'' ;:'+,'/,))':1,(-'+,'+3''2*$/!$*')'/,)-:'-!:/,4')'-'85' $/3$/'B' !(' +3'' 3$+B$*' $(-' □$*$:B!' *$+$.' '' !:' 3,@'4')' .(@!**!(2'+,' 'E1)'::'$(' ,1!(!,(',(',+3')'2*$/!$+!,(:',6'+3$+'-!:+)!/+' □3'' 3.2'' ;$::':',6'8,.*-')'/*$5' /3,B!(2'+3'' :B$(-')'$(-' .B'4$**'5:'1),8$8*5'8'*,(2'+,'+3''C$)$6:3$('1')!,-'),;' !1:B!9:'13,+,2)$13:'$(-':+!**';,)'' 6),;' ,)H3'('4:B!9:')'1,)+'@'' /$(' !(6')'+3$+'+3'':!-':',6'+3'' .B:./$(5,(' /,(:!:+',6'5,.(2';,)$!(!/':+.66'$:' +':+!6!'-'85'+3'':+''1'$(2*''$+'@3!/3'+3':''-'1,:!+:',4')3$(2'+3'')!4')

@!(2+,+3'-!66')'(/':,6:(,@*!('')$(2!(26),;=+,=;'@';.:+$*@$5:8'1)'1$)'-+,''(/,.(+')/,(:!-')$8*''4$)!$+!,(:,6*2*$/!')''(-:--'-+,+3,:'/$.:'-85+,1,2)$13!/',(-!+!,(:+3':'4$)!$+!,(:@!**('/'::!+$+'$2)'$+')(.;8')',6;'$:.)';'(+:8'6,)'@'/$(',8+$!('$/*'$)!(:!23+!(+,+3'/*$::!6!/$+!,(:,6+3'.$8!/'!/'$2'

:+,+3''('!238,.)!(2')'2!,(:!+:'';:+3$++@,'2*$/!$*1')!,-:3$4'8''('':+$8*!:3'-@!+3'/')+$!(+5'.(+!(2+,('@3,'3$:',8:')4'-';$(5';,)$!(':$(-+'))$/':'!(+3''□!$(:3$('')!(H@3,'3$:'@,)B'-!(+3'.?$'$(:3$('$(-)!'-')!/3:'('$2)'$+')(.;8')'!:(,+!;1),8$8*''+3,.23:,;'',6+3':'!(+')4$*:';$5';')'*58''-.'+,'!(+')).1+'-')'/'::!,('-8')/,(:!-'):+@,'2*$/!$+!,(:$:1),8$8*''!('(,)+3@':+')('(2,*!$

:+,+3''/*!;$+!/'/$.:':',6+3'',*-'3$+B$*'$(-□$*$:B!2*$/!$+!,(:L@3!/3'1)$/+!/$**5'6$**@!+3!('+3''.$8M$/3$/'B'+3!(B:+3$+3.;!-!+5@$:4')5*!++*''$8,4''+3''1)':'(+8.+3$+,4_!(2+,$':,;'@3$+*,@')'$((.$*+';1')$+.)''+3')''@$:**':'4$1,)$+!,('$(-$**'::')';'*+!(2',62*$/!')'(-:'@'2*$/!7,*,2!:+:'$)''*!B'*5+,'$2)''@!+3'+3!:4!'@'$2$!(:+@3!/3')H8$/3')'3$:'$*)'$-5'1),+':+'-'$(-@3!/3''$*:,'1)'6')'+,':''';,-!6!'-'$*+!++*''35:!/!:+:')''(,+5'+'$2)''-'$:+,'$'6$**,6'+';1')$+.)''L/3$(2'',6':,*$)''(')25M8'!(2'('/'::$)!*5'+3''/$.:'',6'$'2*$/!$*'1,/3'.+'@''::3$**3')'',//.15',.):'*4':'*'::'@!+3'+3''1)!;''/$.:''+3$('@!+3'+3''1),8$8*''/,(-!+!,(:')'!2(!(2'-.)!(2'+3''.$8'2*$/!$7+!,(:□3$+'/,*-'$*,(''/$((,+'1')6,);'+3''+$:B',6'$'1,@')6.*'2*$/!')'$-4$(/''!:'$;1*5':3,@('85',)+3')('!8')!$''/,;8!($+!,('!:'(''-'-',6';,!:+.)''+';71')$+.)''$(-':;$**'$((.$*')$(2'L/,;1$)$+!4'*5'/,,*':.;';')'$(-'/,;1$)$+!4'*5'@$);'@!(+')M'('$':'$'/*!;$+''$('!(/)'$:'',6'/,*-'!:',6'/,.):':.66!/!'(+'8.+'!('+3''.$8'$'6$**',6'+3'';'$('+';1')$+.)''/$('3$)-*5'*'$-'+,'$'/,(:!-')$8*''2),@+3',6'!/''::+)'$;:'□3''8'*+',6'/)5:+$**!(''1)'/!1!+$+!,('@,.*-'8'*,@')'-'!+'!:'+).''8.+'!+';.:+'8'')';';8')'-'+3$+'+3''*,@')':(,@'-,':'(,+'/,(+)!8.+''4')5';./3'+,'+3''4,*.;'',6'$'2*$/!')'',)'-,':'2)'$+')'/,*-'('/'::$)!*5'!(/)'$:''+3''1)'/!1!+$+!,('$8,4''+3''*'4'*',6'+3''::.;;')':(,@6$**:'./3'-'1'(-:'.1,('+,1,2)$135'('(,);,.:':*,1':'2'(+*5')!:!(2'+,'2)'$+'3'!23+:'+3''';')''-'1)'::!,('',6'+3'':(,@6$**';$5'/$:''(')2'+!/'2*$/!')'2),@+3'@3!*'!('-!::'/+'-';,.(+$!(:'+3''$-4$(/'',6'+3''2*$/!'):';$5'8'':;$**/,;1$)'-'+,'+3''-'1)'::!,('',6'+3''1');$('(+:(,@'*'4'*''(/''!+!:'4')5'!;1,)+$)M+'+,'/,(:!-')'$+'@3$+':+$2'',6'$'2*$/!$+!,('$'/3$(2'',//.))'-'□3''-':/'(+'$(-*'(2+3',6'$'2*$/!')'@!**:3,@'$'-!66')'(+'1),1,)+!,(',6'2),@+3'$//,)-!(2'+,'+3''1,!(+'$+'@3!/3'!+?.:+'3$11'(:+,'8''@3'+3')'!('$':3$**,@'8$:!(',)'$;,(2'-''1*5'),-'-':*,1':'@3'+3')':+!**('$)'+3''+,1:',6'+3'';,.(+$!(:',)'$*)'$-5'8'5,(-'+3'!)'6,,+

('+3''@3,*''3.;!-!+5'!:'+3'';,:+!;1,)+$(+'6$/+,)'$(-'$')'-./+!,(',6'+3''$((.$*)$(2''';.)''!;1,)+$(+'+3$('$'*,@')!(2',6'+3''$((.$*';'$('8''*!'4''+3')'6,)''+3$+'-.)!(2'+3''';$!('.$8'2*$/!$+!,(:'+3''):$!(6$**';.:+'3$4''8''('2)'$+')'+3$(',@'□3''1)':'(+'$)!-!+5',6'+3''$;!):':'';:+,'!(-!/$++''$'1)'++5

).& *

/ , ; 1*'+'' 'E3$. :+!, (' , 6' 4$1 , .)' : ,' +3$+' $' 6$**' , 6' +' ; 1 ')$+.)'' /$((, +' 2!4 '' $' :+), (2' ! ; 1 '+. :' +, ' +3 '' 2*$/!'): ' $:+, (' C: D' : 3' " ' %& FM' +3!(B:' +3$+' +3 '' .), 1 '$(' /, $:+$*' /*! ; $+'' !:' ; ,)'' : ' (:!+!4 '' +, ' +3 '' 6*. /+. $+!, (:' , 6' :, *$)' ' (')25' +3$(' +3 '' /, (+!(' (+$*' /*! ; $+' ' @3!/3' ; '$(:' +3$+' . (- ')'' E+)' ; '' !(+')!,)' /, (7 -!+!, (:' $' /3$(2'' !(' +3 '' : . (9:' 6,)/'' @!**' (, +' 1), - . /'')' : . *+:' , 6' $' ; $2(!+. -'' 'K. $*' +, ' +3$+' !(' +3 '' *1 :' ,)' B$(-!($4!$ ' +' ; $5' K. !+'' @' ** 8'' +3$+' , @!(2' +, ' +3!:')' $:, (' @'' :3$**' 1 ')3$1:' !(' +3 '' 6. +.)'' -!: /, 4 ')' +3$+' +3 '' . $8' 2*$/!$+!, (:' :3, @' $' *' : : ')' (. ; 8 ')' , 6' @' ** ; $)B' -' : . 8 -!4!:!, (: ' : . /3' $:' $) ''+)$/' $8*'' !(' .), 1 ' ' $((' :$5:' +3$+' /, *- ')' : . ; ; '):' $)'' (, +' $')'*!$8*''!(-!/$+,)' , 6' !/'' $2' : ' $(-' +3$+' +3 '' 1), 8*' ; ' !:' 'E/'' -!(2*5' /, ; 1*!/$+' -' , @!(2' +, ' +3 '' , 4')). *!(2' :3$)'' , 6' 1)'/!1!+$+!, (')$(B*$(-' $(-' '/B')' LK. , +' -' 85' $((M' +' ** . :' +3$+' +3 '' 6,) ; $+!, (' , 6' 2*$/!'):' !:' $' +). '' 1), /' : :' , 6' -!:+!**$+!, (')'K. !)!(2' 8, +3' 3'$+' $(-' /, *- ' □3 '' 1), - . /+' , 6' -!:+!**$+!, (' @, . *-' 8'' -! ; !(!:3' - ' (, +' $. 2 ; '(+' -' 85' $' *, @')!(2' , 6' +' ; 1 ')$+.)'' +' !:' (, +' ! ; 1, : :!8*'' +3$+' +3 '' +' ; 1 ')$+.)'' $+' :'$' *'4'** @$:' 3!23')' - .)!(2' +3 '' 2*$/!$** 1 ')!, -' +3$(' +, -$5' !/B')' !:' , 6' , 1!(!, (' +3$+' +3 '' . $8' /*! ; $+'' - .)!(2' $' 2*$/!$** -4(/'' ; . :+' 3$4'' 8'' (' ; !*-')' !'' ; ,)'' , /'$(!/' □3$+' @, . *-' ; $B'' : . ; ; ')' /, , *')' $(-' @!(+')' @$) ; ')' /, . 1*' -' @!+3' $(' !(/)'$:'' , 6')$!(6$**' $+' $**' :'$:, (:' □3 '' $; !):' (, @' $' -!:+)!/+' , 6' :. ; ; ')')$!(:' @!**' 3$4'' 3$-' $' 2, , -' -'$*' , 6' @!(+')' 1)'/!1!+$+!, (' . ; ; ')' 8'!(2' /, *-')' +3')'' @$:' *' : :' ; '*+!(2' , 6' +3 '' 2*$/!'):' '' ; . :+' 8'@$)'' , 6' ; !E!(2' . 1' /$. :'' $(-' '66'/+' . ; ; ')' @$:' /, , *')' 8'/$. :'' +3')'' @$:' ; ,)'')$!(' $(-' $' 2)'$+')' ; '$(' /*, . -!(' : ' (, +' +3 '' , +3')' @$5'), . (- ' □3!:' K. ':+!, (' ; $!(*5')' :+:' . 1, (' +3 '' 1), 8*' ; ', 6' +3'' - ' :!//$+!, (' , 6' :!$' 6' !+' /$(' 8'' 1), 4' -' +3$+' /, (:!- ')$8*'' :3'' +:' , 6' @$+')' 'E!:+' -' !(')$*, /$:1!$' $(-' '*:'@3')' '+3' (' +3 '' 2*$/!$*' /*! ; $+'' , 6' +3'' . $8' ; . :+' 3$4'' :3, @(' $11), E! ; $+!, (' +, ' +3$+' , 6' .), 1 ' ' $(-' +3'' ; ,)'' +3'' *$)2')' +3'' *$B':' @')' ' :' , .)' 1)':' (+' 2', *, 2!/$*' B(, @*' -2'' 1, !(+:' +, ' +3'' *!B'*!3, , -' , 6' :. /3' !(*$(-' :'$:' $(-' $:' /, *-' $*, ('' $11'$):' +, ' 8'')$+3')' !('66'/+. $*' !(' $' -)5' /*! ; $+'' , ('' /$((, +' 2, ' 6$)' @), (2' !(' $:/)!8!(2' +3 '' , *-' . $8' 2*$/!'):' +, ' $' 2)'$+')' 3. ; !-!+5' /, . 1*' -' @!+3' +3'' $:' 5'+' . (B(, @(' 2' (')$*' /$. :'' , 6' 2*$/!$*')'/). -':/'(/'' $(-' 1')!, -!/!+5' '' 3$4'' +, ')'/B, (' @!+3' +@, ' 6$/+,):' !(' +3 '' . $8' +3'' *, /$*' , ('' $(-' +3 '' @,)*- @!-'' , (' ' □3 '' *, /$*' !(6*. '(/'' *'$-:' . :' +, ' +3'' /, (/*. :!, (' +3$+' $+' +3'' 8'2!((!(2' , 6' /*! ; $+!/')'/B, (!(2' L!' '' '(-' , 6' +')+!$)5' 1')!, -M' +3'' . $8' /*! ; $+'' @$:' *':' -!4')2'(+' 6), ; ' +3'' .), 1 '$(' ,)' *1!('' , (' +3$(' !+' !:' (, @' +3$+' +3 '5' $11), $/3' !(' *!B'(':' $:' @'' 2, ' 8$/B' !(' +! ; '

8, 4'' $**' @'' ; . :+')' ; ' ; 8')' +3$+' $' 6$**' , 6' +' ; 1 ')$+.)'' @!**')'-./'' '4$1,)$7 +!, (' ' (/'' !+' !:' 'E/'' -!(2*5' ! ; 1,)+$(+' +, ' B(, @' @3'(/'' /, ; ':' ; , :+' , 6' +3'' 4$1, .)' /, (-'(:'-' !(' +3'' . $8' @3'+3')' 6), ; ' +3'' , .+:!-'' L,)' :'$M' ,)' 6), ; ' !(+')!,)' /!)/. *$+!, (' @3'+3')' 'E+')($*' ,)' !(+')($*' +.)(, 4')' !:' 2)'$+')' @3'+3')' +3'' 2*$/!'):' $(-'). ((!(2' @$+')' $)'' ; , :+*5' :'(+' $), . (-' $(' !(('):' $+ ; , :13')!/' +)$/B' ,)' @3'+3')' +3'5' 6,) ; ' +3'' 8$*$(/'' 8'+@'' (' +3'' ! ; 1,)+:' $(-' 'E1,)+:' , 6' 4$1, .)' 6' +3'' +.)(, 4')' !:' ; $!(*5' $(' !(+')!,)' , (' ' +3'(' $' . (!6,) ; ' !(/)'$:'' , 6' /, *-' @!**' -'1)':' +3'' :(, @' *'4'*' 2*$/!')' '(-:' $(-')$!(' 8'*+:' $' *!++*' ' 8 . +' +3'' 2*$/!'):' /, . *-

(,+2$!(; ./3 !(8.*B $: +3') @,.*- 1),8$8*58 (!(/)'$: ,61)'/!1!+$+!,($8,4 +3 1)':'(+ :(,@ *!(6 ; ,) 4$1,.) !: 6,)/'- !(6),; ,.+:!- ,) !6 !(*$(- :'$: $) /)'$+'- +3'(+3 8$*$(/ ,6 ; ,!:+.) $: $ @3,* !: $.2; '(+- $(- +3 2*$/!'): $) 4!2,),.:*5 6'- 3 -!66!/.*+5 ,6 +3 1),8* ; *!': !(B(,@!(2 'E$/+*5 3,@ +3 2!4 $(- +$B ,6 4$1,.) !: @,)B'- 8'+@''(('!238,.)!(2)'2!,(: 6,) @3$+ !: 2$!('- 85 ,(+3 ,+3') ;.:+ *,: + :'' ;: .(*!B'*5 +3$+ $ /,(+!('(+* $)'$ @!** 8 4')5 ;./3 $66'/+'- !(!+: 2*$/!$+!,(85 $;') /3$(2 ,6 $((.$* +' ;1')$+.)' .(*': /,.1*'- @!+3 $ -!66')'(+ -!:1,:$* ,6 *$(- $(- @$+') ,) $ /3$(2 ,6 +3 2)'$+ @!(- +)$/B: /$(K.!+'@'** !;$2!(+3$+ +3 !/ $2 @$: 1,::!8*5 -. +, $ @,)*- @!- .(!6,); 6$** ,6 +'; 1')$+.) L:,*$),) /,:;!/M 8.+ +3 '66'/+ ;.:+ 4$)5 '(,)7 ;,.:*5 @!+3 +3 ;,)13,*,2!/$* 6'$+.)': ,6 +3 *$(- ,*- $*,(!: $ 1,,) !(:+).;'(+ 6,))$!:!(2 +3 3.;!-!+5 ,6 /,(+!('(+: @3')'$: $(!(/)'$: ,6 3.;!-!+5!: !(!+:'*6:.66!/!'(+ +, !(4!2,)$+ 2*$/!$+!,(@!+3,.+ +3 /,**$8,)$+!,(,6 /,*- L! 'E+)$'/,*- 6),;,.+:!- $: 1)+ 6),; +3 /,,*') :.; ') 1),-./'- 85 /*,.-!('::M (+3 .$8 +3 K.':+!,(,6 ;,!:+.) :.11*5 !: +3 *'$-!(2 ,($(- @ ;.:+ :''B 6,))'$:,(: +,1,2)$13!/ $(- ;'+',),*,2!/$* /$1$8*' ,6 'E1*$!(!(2 $ 2)'$+') 3.;!-!+5 ,6 +3 @3,*' +M.$8 $+;,:13')' 6+') +3$+ +3 .(!4):$* 2*$/!$* /$.:' @3$+'4') !+ ;$5 8' +$B':)$(B $: +3 1,::!8*')'2.*$+,) -'+');!(!(2 +3 11)'(+ :5(/3),(!:; ,6 2*$/!$* '4'(+: $** ,4') +3 '$)+3

(/,;1$)!(2 +3 4$)!,.: 2*$/!$+!,(: ,6 +3 :$; -!:+)!/+ $(- +3,: ,6 -!66')'(+ 1$)+: +3 3'!23+ ,6 +3 :(,@ *!(!: .:.g<**5 +$B'($: $ 4')5 -!)'/+ :+$(-$)-':, +3$+ 2!4'($:!;!*$) ,),2)$135 +3 :(,@ *!(@,.*- -'+');!(+3 :!H ,6 +3 2*$/!'): @,(-')(,@ !6+3!:).*' !: $:)'*!$8*' $:,(+3!(B: !6*!B' 2),.(- $8,4 +@, :(,@ *!(': (''- (/'::$)!*5 3,*- +3 :$; $;,.(+ ,6 (4- $(- !/'!(-!66')'(+ 1$)+: ,6 +3 @,)*- ::.;!(2 $:!;1*' /$: *'+ .: :$5 +3$+ $/,(,) $ 8$:!(,6 'E$/+*5 +3 :$; :!H $(- :3$1 !:':+.1,($:(,@ *!(,6 ;!(+3 *1: $(- .1,($ = ; :(,@ *!(!(+3 *$! : !+ +3'($ 6,)'2,(/,(/*.:!,(+3$+ .1,(+3': 'K.$* :.)6$/':): +3 :$; @'!23+ ,6 (4-c :3,.*- :$5 (,+ 8'/$.: +3 :(,@ *'4'* !:(,+ $ -!)'/+ 'E1)'::!,(,6 +3 K.$(+!+5 ,6 1)'/!1!+$+!,($(!+: 1)':')4$+!,(!(+3 :3$1 ,6 (-4 8.+ $*:, ,6 +3)$(2 ,6 + ;1')$+.) , +3!: -!66!/.*+5 ,6 /,;1$)!(2 'K.$* ,),2)$13!/$* /,(-!+!,(: $8,4 $ /,;;,(8$: ,6:(, *!(;.:+ 8 $--'- +3$+ ,6 -!66')'(+ :.)6$/' 6,),$+!,(+ :!:,@!(2 +, +3': -,.8+:$(- /,;1*!/$+!,(: +3$+ +3 /,;71$)!:,(,6 2*$/!$* 1')!,-:!(-!66')'(+ /*!;$+': $(- *,/$*!+!': !: ;./3 ,8:/.)'- (!;1,)+$(+ 1,!(+ !: +3 $8:,*.+ 3'!23+ ,6 +3 ;,.(+$!(: $(- !+:)'*$+!,(+, +3 :(,@ *'4'* 3.: +3 +,@')!(2 3'!23+ ,6 +3 *$! $;!): ,66'): $ 2,,-'- $* ,6 /,;1'(:$+!,(6,) +3 *,@') 1,:!+!,(,6 +3 *1!(:(,@ *!(*,:: 2!(;.:+ 8 '(+')'- 2!(:+ 3 .$8 ;,.(+$!(: ,@!(2 +, +3 2)'$+') !:,*$+!,(,6 +3!) :.;;!+: :3,.*- $*:, B''1'!(;!(- +3$+ +3 ;$E!;.;)$!(6$** !: 8,.(- +,/')+$!(*'4'*: $8,4 @3!/3 +3) !: $-/)$: (/ :3!6+!(2 ,6 +3!:

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+')+!$)5' '),:!,('L1''('1*$!('+3',)5 *$+'*5'-'(!'-' 85' !:+'*' $(-' $)+,(('M',)',('+3'' 1*$+'$. *!B'' @$)1!(2:' ,6'+3'' '$)+3:' /).:+' :,' +3$+' /, ;1$/+' :.)6$/':' @')'' $8,4'' +3'':(,@' *!('' 5' '),:!,(' +3':'' 2'(+*'':*,1':' @')'' *,@')'-' $(-' -!4!-'-' @3')'85' +3'' 2*$/!'):' -':/'(-'-' ; ,)'' :+'' 1*5')'$/3!(2'+3'!)' ; '*+!(2' 1,!(+' ; ./3' :,,(')'!('-''1*5':.(B'('8'-:

(-,.8+'-*5' .13'4*:' $)'' ,6+'(' !(:+). ; '(+$*' !(' :+!; .*$+!(2' 2*$/!$+!,(' 85')$!:!(2'+3'' *$(-' +,@$)-:' +3'' :(,@' *!(' ' 8.+' !(' +)'$+!(2' $' @!-'' $)'$' +3':'' 1,:+' +')+!$)5' @$)1!(2:' 3$-' 8'++')' 8'' *'6+' $:!-'' . (*'::' @'**' ':+$8*!:3'-' *,/$**5' (' *!;!+'-' :1$/':' +3'5' /$(' 8'' ; $-'')':1,(:!8*'' 6,)' $(,; $*,.:' -'4!$+!,(:' 6),;' +3'' 8'3$4!,.)' ,6'+3'')'2!,(' $:' $' @3,*'' ' 1),6':' *!++*'' 8'*!'6' !(' +3,:'' +3',)!':' @3!/3' $**,+' +,' +'/+,(!/' *!6+!(2'+3'' ; $!(')':1,(:!8!*!+5' 6,)' +3'' !/'' $2'' ,6' *$)2'' '$)+3' :1$/':' (' @,.*-' 3$4'' +,' $11*5' +3-' +3',)5' +,' +3'' @3,*'' @,)*-' 85' :3,@!(2'2',*,2!/$**5'+3$+')'/.))!(2'$)+3':1$:;:' $*@$5:'*'-' +,' .13'4*:' $+' +3'' @'$B':+' :1,+:' +3$+' !:' +,' :$5' @3')'' 6,*-!(2:' $*)'$-5' '?-:+'-' ,:+ +')+!$)5')'+.)(:' @,.*-' 3$4'' +,'8'' 1),4'-' $(-' ,)+3' ; ')!/$')' ; $!('$' 3$)-' (.+')'@'' ; .:+' '(+!)''*5' 8(-,(' '4')5' +3,.23+',6' :5(/3),(!:;' :,'+3$+' 4$)!,.:' 8!2' 2*$/!$*' 1')!,-:' $)'' (,+' /,((''/+'-' $+' $**

(' +3'' :+)'(2+3',6' +3'' 6,)'2,!(2',8:')4$+!,(:' !+' @!**' 8'' :''('+3$+' '4'($:: .;!(2' $' .(!6,);' /,:;!/' /$.:'' ,6' .(!4'):$*' 2*$/!$+!,(' +3'' 2)$13!/' /.)4'' :3,@!(2'+3'' ; $)/3',6'13'(,;'($' $(-'+3'!)')'*$+!4'' !(+'(:!+!':' ; .:+' 3$4'' 8''(' -!66')'(+' !(' 4$)!,.:')'2!,(:' +' /,))':1,(-!(2' +!;':' +3'' 1),1,)+!,(:' ,6'+3'' 2*$/!$*' :+$2':' /,;1$)'-'+,' '$/3',+3')' ; $5'3$4''8''(' K.!+'' -!66')'(+' !(' +3'' *1:' $(-'+3'' .$8' □3'' .$8' .);' ;'$:.)'-'85'+3'' .$8' !:;' $5'6,)'!(:+$(/'' 8'' ; ./3':;$**')',)'2)'$+')'+3$(' +3'':$;'' *1!('' 1')!,-' /,;1$)'-'+,' !+:' 1)'-'7 /'::,):' ,;'' !(+');'-!$+'')'/).-':/'(/':' $(-')'/'::!,(:' ;$5' 8'' ,8:/.)'-' @3!*'' ,+3'):' ;$5' 3$4'' $++$!('-' $' 2)'$+')' !;1,)+$(/'' L)'*$+!4'*5' +,' +3'!)' ,@('1$:+' $(-' 6.+.)'M' +3$(' !(' +3'' *1:' :,' +3$+' +3'' 1!/+.)'' ,6'+3'')!:'' $(-' 6$**' ,6' ;,)$!(!/' $(-'),:!4'' 13'(,;'($' !(' +3'' +@,' ;,.(+$!(')$(2':' @!**' :3,@' +@,' /.)4':' ,6'$' -!66')'(+')$+!,' 8'+@''(' :.//''-!(2'$;1*!+.-':' .+' /3),(,*,2!/$**5' +3'' /3!'6' ;$E!;$'$(-';!(!;$';.:+'8'' ;$-'' +,' /,))':1,(-' !6'@'' @!:3'+,' B(,@' !6'+3'' .1:' $(-'-,@(:',6'+3'' !/'' $2'' @')'' /,(+),**'-' 85' $(',.+:!-'' ,)' /,:;!/' /$.:'' ' $2)'' ' @!+3' ':::' !(' +3'' /*,:!(2' @,),-:' ,6' 3!:' 8,,B' Q' □3'' /$.:'' ,6'+3'' 2*$/!$*' 1')!,-:' !:' $')!--*'' +:' :,*.+!,(' !:' 8':+' 6.)+3')'-' 85' $' 8'++')' B(,@*'-2'' $(-' /*,:')' !(4':+!2$+!,(',6' +3'' /*!;$+!/' /,(-!+!,(:',6' 2*$/!$+'-' /,.(+)!':' $(-' +3'' +)$/':' ,6' 6,);')' 2*$/!$+!,(:0' □,' '4')5' :+.-'(+',6'+3'':'' 1),8*';:' $(-' +,' '4')5' 2*$/!$*' 'E1*,)')' ')'/,;;'(-' +3'' .$8' $:' $')'2!,(',6'+3'' 3!23':+'!;1,)+$(/''@3')'' ;$(5'!(+')':+!(2'K.':+!,(:' ;$5' 8'' :,*4'-' $(-' ('@',(':'1.+

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□3''' 1),8*';''',6''-':!//$+!,(''@3!/3''3$:''',//.1!'-'';$(5''':/3,*$):''!:''$*:,''!(+!;$+'*5'8,.(-''.1'@!+3''/*!;$+''$(-'8$:'-'',(''+3'''':$;'''6.(-$;'(+$*';'+',),7*,2!/$*''*';'(+:''$:''+3'''1),8*';''',6'2*$/!$+!,('''.+'6),;''+3'''8'2!((!(2''@$)('+3''')'$-')'2!(:+''!-'(+!65!(2''+3'''-':!//$+!,('',6''((')''':!$'@!+3''+3'''2'(')$*'-'2*$/!$+!,('',6'!(+')2*$/!$*'$(-'1,:+2*$/!$*'1')!,-:

')'''2!('@''':'''3,@'!;1,)+$(+'$'1$)+'3.;!-!+5'1*$5:'!('+3'''135:!/$*''/,(,;5',6'+3''@,)*-''!)'+';1')$+.)''$(-'3.;!-!+5'$)''!(:'1$)$8*'''6$/+,):',6+'('4!/$)!,.:''',*$)'3'$+'';,-!6!'-'85'+3''':3$1''$(-'1,:!+!,('',6''$)+3'85'+3''-!:+)!8.+!,('',6'*$(-'$(-'@$+')'85'/,(+!('(+$*!+5'$(-'$*+!+.-''1),-./':'$('!(+)!/$+'':5:+';',6'@!(-:''4$1,)$+!,('$(-'/,(-'(:$+!,('□3'''@3,*'''6,);:'$(',)2$(!:;',6'/*!;$+!/'/!)/.*$+!,('(5+3!(2'$66'/+!(2'+3'''@3,*''@!**'$66'/+'!+:'1$)+:'!('4$)!,.:'@$5:'$(-'+,1,2)$13!/'/3$(2':'!('(''1$)+'@!**'!(6*.'(/''!+:':.)),.(-!(2:''(/''+3'''/*!;$+!/':5;1+,;:',6'$'1,)+!,(',6'+'))':+)!$*'$($+,;5';$5',@''+3'!)'/3$(2'',6'/3$)$/+')'!+3')'+,'$'2'(')$*/$.:''',)'+,'*,/$*'/3$(2':'$(-'+3':''*,/$*'/3$(2':';$5'8''@!+3!('',)'!('+3''!;;'-!$+''('!238,.)3,,-')$/+!/$**5'@''/$('+$B''!+'6,)'2)$(+'-'+3$+',(*5'$'+)';'(-,.:'/3$(2''!('+3''/,(-!+!,('',6'+3''':.('@,.*-'8''/$1$8*''',6'.1:'++!(2'+3''1)':'(+'$))$(2';'(+',6',/'$(!/'$(-'$+;,:13')!/'/.))'(+:'85'2'(')$*'+';1')$+.)''$*,(''''!(2';,)'7,4')'+3$+'+3''/,,*!(2',6'+3''')+3'$(-'!+:'2',*,2!/$*'1),2)':':'@')''6$)';,)'')$1!-'+3$('$(5'/,,*!(2',6'+3''':.('@''';$5'*,,B'.1,(':,*$)'3'$+'$:''$'/,(:+$(+'6$/+,)':.8?'/+',(*5'+,'/,;1$)$+!4'*5':*!23+'6*./+.$+!,(:'L:.(:1,+:'/,:;!/':1$/':cM'!'@''-'!('+3!:'*!23+'+3''13'(,;'($',6'+3''!/''$2''@')''+3''*,/$*':5;1+,;:',6'$'2'(')$*/,,*!(2'$++$/B!(2'+3,:''1$)+:',6'+3''+'))'':+)!$*',)2$(!:;'@3!/3'@')''1)'-!:1,:'-'+,'2*$/!$*':@'**!(2'85'+3''1)':'(/'',6'3.;!-!+5'□3$+'+3''2'(')$*6$**',6'+';1')$+.)''L@3!/3':,'6$)'@'';.:'$//'1+'$:'+3''8':+'$4$!*$8*''''E1*$($7+!,('',6':5(/3),(!:;M'@$:'/,;1*!/$+'-'@!+3'.13'4*':.8:!-'(/''-'(.-$+!,('!(),$-:',6'+3''':'$':'-!;'(+$+!,('''+\G'2,'':'@!+3,.+':$5!(2'8.+'+3''4$*.'',6'+3'!)')':1'/+!4'':3$)''-'1'(-:'.1,('+3'')''*$+!4''-.)$+!,('',6'+3''2'(')$*'$(-'1$)+!/.*$)'/$.:'':'$(-'1),/'::':''-',(,+'B(,@'3,@';./3',6'+3''6!($*'66'/+';.:+'8''$11,)+!,('-'8'+@''('+3''-!66')'(+'/,,)-!($+'-',)':.//'::!4''/$.:':'@3!/3').*'-'!('+3''1$:+'+,'@3$+''E+'(+'*,/$*'135:!,2)$135';$5'3$4'')'+$)-'-',.+7:+'11'-',)'*$22'-'8'3!(-'+3''.(!4'):$*',)'('!238,.)!(2'!(6*.'(/':'$/+!(2'.1,('+3''';$)/3',6'$'/')+$!('13'(,;'(,('':./3'$:'2*$/!$+!,('',)'-':!//$+!,('+'!:'+3''2)'$+'K.':+!,('',6'+3''2',*,2!/$*'/$*'(-$)'□3''.()$4'*!(2',6'+3!:'+$(2*''+3''/$*/.*$+!,('',6'+3''E$/+'4$*.':'L!('+!;''@'!23+'$(-'4,*.;'M',6';,)13,7*,2!/$*'1),/'::':'!:'+3''+$:B',6'+3'':/!'(/'',6'+3''6.+.)'

''';$5':$5'+3')'6,)''+3$+'+3''3!:+,)5',6'/*!;$+''!:'+3''3!:+,)5',6'+,1,2)$135'$(-'+3$+'/,(:'K.'(+*5'+3''K.':+!,('',6'+,1,2)$135'$:'/$.:'',6'/*!;$+'':3,.*-'$*@$5:'1)'/'-''+3$+',6'/*!;$+''$:'$'/$.:'',6'+,1,2)$135'''(/''+3')'';.:+'8''$'+$/!+'.(-'):+$(-!(2'+3$+'!('$:/)!8!(2':,;''135:!/$*'/3$(2''+,'$'/*!;$+!/

,('@'+3!(B,61),8$8*'2',*,2!/$*,);,)13,*,2!/$*/3$(2':!('+3''('!238,.)73,,-$:+3''('$)':+$2'(+@3!*'+3''66'/+,6$.(!4'):$*,);$:+),(,;!/$*!(6*.'(/'3$:$*:,+,8'-'+');!('-//,)-!(2+,+3'2',2)$13!/$*/,(-!+!,(:1)'4$!*!(2$+3''+!;''6!+:$-4'(+3'3''; ,)13,*,2!:+!:('$)*5$*@$5:,(+3':$6':!-'@3'(*,,B!(2.1,('/*!;$+'1.)'*5$:$6.(/+!,('$:$')'6*'E',6$(-3513'(8'+@''(:.)6$/':

:/*!;$+''E1)'::':+3'';,)':.8+*'K.$*!+!':,6$')'2!,(!+:1!)!+.$*/3$)$/+')$:,('';!234:$5!+:-'+$!*'-':/)!1+!,(!:8':+/,(6!('-+,+3':;$**')2',2)$13!/!(-!4!-.$*:'$(-!+:3!:+,)5+,$:3,)+1')!,-,62',*,2!/$*+!;''''/$(',(*5/,(('/+$4')5454$2.''!-'$L,)+,,;$(5!-'$:M@!+3$Q/*!;$+'',6'$)+30?.:+$:+3'Q/3$)$/+')',6;$(B!(-0@,.*-':$5*!++*'',)(,+3!(2$@:':3,.*-'8':2'('')$*:1,::!8*''8.+3''+3!(2:+,'@3!/3+3'5$)''$11*!'-':1$)+!/.*$)':1,::!8*''*!;$+''8'!(2:5;1+,;$+!/,6$(!(-!74!-.$*-!:+)!/+!+:4$2$)!':$)',64!+$*!(+)':+,(*5:*,(2:+3!:!(-!4!-.$*)';$!(:+3':$;''!(!+:$*!'(+2',2)$13!/$*6'$+.)':6!+!:/3$(2'-''(+!)'*5+3'!;1,)+$(/'',6!+:/*!;$+!/';'+$;,)13,:!:1$*':!(+,!(:!2(!6!/$(/'8'6,)'+3'2)'$+')2',*,2!/$*'4'(+6+3''/,(:+$(+4$)!$8*',6'+,1,2)$135':$'$/,,)-!($+',6'/*!;$+''8'/,;':+3'6.(/+!,(',6$($(!))$+!,($*6$/+,)',)'+3':'')'$:,(:+3'3!:+,)!/$*$2'',6'/*!;$+'!:'8':+-$+'-'6),;'+3'/*,:'',6'+3'+')+!$)5'1,/3'@3'(+3'/*!;$+!/'/,(-!+!,(:$(-1),4!(/':',6'+,-$5@')''$*)'$-5':+$8*!:3'-'!('+3'!);$!(',.+*!(':

3''-!:+)!8.+!,(',6*$(-3.;!-!+5!:-'+');!('-85+3''1,:!+!,)+,6+3')':')4,!):,);':'$:$(-+3''/,(-'(:'):,);;,.(+$!(:'('/''+3''/*!;$+!/'3!:+,)5',6+3''.$8'8'2!(:'@!+3'+3''E!:+'(/'',6+3''4$:+*$B':',6')$*,/$1!$':+')('!8')!$'$(-,(2,*!$'$(-+3'')$(2':',6*$!'!$(:3$('$;!)'$(-!;$*5',+3'@$+')6!**'--'1)'::!,(:'$(-+'/+,(!/''*'4$+!,(:'@')''1),8$8*5'!('+3'!)'1)!;''$+'+3''8'2!((!(2',6+3''2)'$+'!/''$2'

+';$5'(,+'8''$;!::'+,'$:B'6,)'$'-'6!(!+!,('-':!//$+!,('':!//$+!,('$'2!4'('1*$/'';'$(:'+3$+'+3!:':1'/!6!'-'*,/$+!,('3,*-:'*':'@$+')'$+'$'/')+$!('; , ;'(+'+3$('!+'-!-'8'6,)''('2',2)$135'@''3$4''+,'$--'+3''K.$*!6!/$+!,('+!;''LQ$+'/,))':1,(-!(2'!(+')4$*:OM'8'/$.:''+3''5'$)*5'/5/*''@!+3'!+:':'$:,($*6*./+.$+!,(:'('(+'):'!(+,'$**'+3':''/,;1$)!:,(:''('/''!('),-')',+'+,',8:/.)''+3'':+$+';'(+',)':'$)/3'6,)'/$.:''+3''/,(/'1+',6'-':!//$+!,('; .:+'8''B'1+'6)''6),;'$**'.(/,(:/!,.:':.22':+!,('6'/$.:''':1'/!$**5'$'))+'+',),*,2!/$*,)'/*!;$+!/',('6+')@$)-:'@''/$('($)),@'!+'-,@('6'+3''4,*.;'',6'@$+')'!('$'+.;8*')'-!;!(!:3':'+3'('+3')''@$:'-':!//$+!,('6'+3''+.;8*')'L+3''.$8M'$:'$'@3,*''!))':1'/+!4'',6'!+:.11')',)'*,@')'1,)+!,(',)')';$!(!(2'$!)':1$/''L-':')+',);,.(+$!(:',)'$+;,:13')'M'$(-!))':1'/+!4'',6'/$.:''@3'+3')'4$1,)$+!,(-)!(B!(2'1')/,*$+!,('+3),.23'$'3,*'':1!**!(2',)'6!**!(2'.1'@!+3',+3')';$++')',2)$13!/$*-':!//$+!,('!:'6,.(-'85';'$:.)!(2'+3''@$+')'3'*-'@!+3!('-'6!(!+':1$/':'L*$B'')!4')':'/+!,('2)$4'*'8'-'8,2'/.8'',6'$!)'2*$/!')'-!:+)!/+'/,(+!('(+M'!('-!66')'(+'5'$):',)'/'(+.)!':'+)!/+*5'+3')'6,)''+3''-':!//$+!,('',6''(+)$*

:!$',)+3'' .$8 ; '$(:+3$+$-!:+!(/+,1,2)$13!/$)'$!(/*.-!(2+3''$+;,7 :13')''$8,4''!+3$:*,:+@$+')$:$@3,*'@$+')@3!/3 ; .:+3$4''2,('':,;'7 @3')''*:'',.+:!-''+3!:')'2!,(.(*'::+3')''@$:$')'-./+!,(,6,)!2!($* :.11*5 6),;+3'',/'$(+!:@'**+,'!(:!:+.1,(+3!:1,!(+!+8'!(2$*@$5:1,::!8*'' +3$+,(*5$-!66')'(+-!:+)!8.+!,(,6$(.(-!;!(!:3'-+,+$*+,,B1*$/''+3$+,('' 1$)+@$:6$4,.)'-$+3''E1'(:'',6$(,+3')+3$+3''2*$/!'):-@!(-*'-$(-* $B':),:'',)4!/''4'):$6+3$+3''-':')+8'/$;''-)!')@3!*'',$:'::6*,.)!:3'-6 +3$+3''$((.$*:.;',6$8:,*.+''3.;!-!+5!(/)'$:'-@!+3,.+8'('6!+!(2')$!(6$** ,)4'2'+$+!,('';$5'8'':1'$B!(2',6'+3''.$8$:$@3,*''8.+3!(B!(2',6'$ 1$)+!/.*$)1$)+,),(*5,6+3''1*$!(':+'11'':(,@*!(''2*$/!'):*$B':)!4'):1,1.*$+!,(/!+!':!))!2$+!,(:'-!;'(+$+!,()$!(6$**$8:,*.+'',)')'*$+!4' 3.;!-!+5''+/ 3''K.':+!,(';$5'8''1.+!(''$'35-),2)$13!/2*$/!$*'8!,*,2!/$* ;'+',),*,2!/$*''/,(,;!/',):,/!$*':'(:''$:$11*!'-'+,+3''@3,*'',)'!+:1$)+: :+)!/+-'6!(!+!,('$(-'*!;!+$+!,(,6+3''1),8*';!:+3')'6,)'('/'::$)5'!('$/3' /$:'' ;.:+)'6')'+3,:''-':!),.:',6:+.-5!(2+3':'';$++'):+3,),.23*5'+,+3'' @)!+!(2:',6'),1,+B!('+'!('.(+!(2+,('/3@$)H').B(')'$/3$/'B')$:')' ')2''-!('!/B')'$(-';$(5',+3'):

3''*';'(+',6+!;'' -';$(-:'$'1)'/!:'':+$+';'(+' ,;'':/3,*$):'/,(6!('' +3';:'*4':'+,'+3''2'('))$*1,:+ +')+!$)5')'-./+!,(',6'+3''*$B':',+3'):'2,'!(+, 3!:+,)!/$* -'+$!*,6'+3''*$:+' 5'$):'@3!*''$'6'@''4'('')'/B,('@!+3' ;,-')(' '4'(+:' ')'' $:')'2$)-:'/3),(,*,25' 3,*-'$':+),(2',1!(!,('($;'*5'+3$+' 3$11'(!(2:',6'+3''1)':'(+'+!;'''$(-''4'('',6'+3''*$:+'/'(+.)5'$)''K.!+''!;;$+')!$* !('+3!:'1),8*';' ''8'2!('$+':./3'$('$')*5'-$+''+3$+'F ',)% '5'$):'6,);' $8,.+'+3'':;$**':+'.(!+',6':.8-!4!:!,(3''8(-,(;'(+',6'+3''-'$-'/!+!':',6' +3'' ,1'8$:!('L$)!;M'!:',(*5?.:+$-;!::!8*''$:'4!-'(/''8)!(2!(2'+3''1),8*';' .1'+,'$('E/''-!(2*5';,-')(' +!;''+,'+3''2',*,2!/$*Q'+,-$5O'!('6$/+' ,)'7 ,4')'+3''6$+'',6'+3'' ,1'/!+!':';$5'(,+8''+3''$-'K.$+''E1)'::!,(',6'$:*,@' 1),/'::'8.+'$';$2(!6!'-'1),?'/+!,('+3),.23':.--'('!(+')).1+!,(',6'+3'')'/,)-!(2' ,$:!:'L:''*$+')M' (5+3!(2',8:')4'-'-.)!(2'+3''1$:+'/'(+.)5',)'/,4')'-'85*+3'' *$+':+'E$/+':/!'(+!6!/')'/,)-':'.:/3$:'+3'';'+',),*,2!/$*,8:')4$+!,(:',)')!:'',6' $B'')$*-.)!(2'+3''*:+'+3!)+5'5'$):'-,':'(,+'/,.(+'$+'$**'.(6,)+.7 ($+'*5' 3'':'')'/'(+'6$/+:';$5'8''(,+3!(2'8.+':;$**')',)'2)'$+')'6*./+.$+!,(:' ,6'+3''2'(')$*-,@(@$)-',)'1')3$1:''4'('$('@'.1@$)-'2)$-''(,+3!(2'8.+' ,:/!**$+!,(:',6'$'/.)4'',6'@3!/3'@''-,'(,+'B(,@'+3''+.)(!(2'1,!(+' :'+,'+3'' 6.+.)'' /$('8''8)!'6' ''B(,@'(,+3!(2',6'+3''6.+.)''$(-'+3'':$6':+'$::.;1+!,(' !:'$*@$5:'+3$+'+3!(2:'@!**/,(+!(.'':'$:'+3'5'3$4''2,('8'6,)''-.)!(2':!;!*$)' !(+')4$*:',6'+!;'' +3$+'+3''+'(-'(/5',6'+3''1,:+ +')+!$)5'1')!,-'@!**:+!**1),/''-' 6,)'.(+,*-'/'(+.)!':'+3$+',6'+3''*$:+'+3,.:$(-'5'$):'6,)'1')3$1:'$(,+3')'+3,.:$(-' +3$+',6'+3''*$:+'+'('6,)'$':3,)+'+!;'' :'),1,+B!(')!23+*5',8:')4':'+3'' -':!//$+!,(',6' .)$:!$'!:'$'2',*,2!/$*6$/+' '':+$)+'6),;'+3''*$:+'(,+$8*'' 2',*,2!/$*/,(-!+!,('6),;'+3''E!:+'(/'',6'+3'')$*,/$:1!$('*$B''$'1,)+!,(',6' @3!/3'@$:':!+.$+'-'@!+3!('+3'' .$8'$(-'@3!/3'8'*,(2'-'+,'!+'!('+3'':$;'

J'(:'$:'+3'' +*$(+!/'8'*,(2:'+,' .),1''L,)' ;')!/$'''+/M' ,@'+3!:'!(*$(-':'$',)!2!($+'-'!:'8'5,(-'+3'':/,1'',6',.)'!(4':+!2$+!,(' □3$+'.13'4*'$(-').(,66'$)'',+'/3!'6*5')':1,(:!8*''6,)'+3'')'-./+!,(' ,6'+3''2)'$+'*$B'',)'*$B':',6' '(+)$*' :!$'$(-'□.)B':+$('@'' ;$5'+$B''6,)'2)$(+'-'+3,.23':'-!;'(+$+!,('L6*.4!$*'$(-'$',*!/M' ;.:+'3$4''$/+'-'$:'$'/,(+)!8.+,)5'/$.:''85' ;$B!(2'+3''@$+')':3$**,@'$(-'6,)/!(2'!+',4')'*$)2')':.)6$/':',6'4$1,)$+!,(' +'3$:'(,+'B'1+'1$/''3,@'4')'@!+3'+3''')'+!)';'(+',6'<$B'')$*'6),;'+3'' H8,!'/3$((''*'' ;$5'+3')'6,)'':''B'$('$+;,:13')!/'!''/*!;$+!/')':$:,(

4!-'(+*5'+3'('+3'' .$8'3$:'*,:+'@$+')'8'/$.:''+3''*$B''@$:'4')5';./3'*$)2')'$(-'8'/$.:''!+'!:'.(*!B'*5'+3$+'+3'' ;!::!(2'8$*$(/'':'+!*'@!+3!('+3''-!:+)!/+'!('+3'':3$1''6'2*$/!'):',)':.:1'(-'-'4$1,.)' !(/''+3''!(*$(-':'$'@$:'6,);'-'$'/,(:+$(+'*,::'3$:'8''('2,!(2',('!('+3'':3$1''6'$'8$*$(/'',6'4$1,.),4'):+'11!(2'+3''8,.(-$)!':',6'('!238,.)!(2')'2!,(:'@3')''!+'@$:'/,(4')+'-'!(+,'2*$/!'):',)')$!(6$**'-)$!(!(2'!(+,'+3'',/'$(' □3!:'1$::!4''8$*$(/''/$))!'-'$@$5'85'$':*!23+',4')1*.:',6'1)'4$!*!(2'@!(-:'/,.*-'1),8$8*5',(*5'8'':3,@('85'$';!**'($)5'$4')$2'' +';.:+'3$4''2),@('$.+,;$+!/$**5'@!+3'+3''1),2)'::',6'-':!//$+!,('@3')'85'!(/)'$:!(2'*$(-':.)6$/':'@')'':.8?'/+'-'+,':,*$)'3'$+!(2'$(-'!(/)'$:!(2'K.$(+!+!':',6'$:/'(-!(2'4$1,.)'*!6+'-',4')'+3''@$+'):3'-:' 3'+3')'+3!:';'$(' ;!**'($)5'*,::'3$:'$*)'$-5'1$::'-'!+:' ;$E!;.;',)'(,+'@''/$((,+'B(,@'8.+'!+'/$('3$)-*5'2,',('!(-'6!(!+'*5'$:'*,(2'$:'+3''@$+'):3'-:'$)''(,+'*,@')'-'/,(:!-')$8*5'6,)':,;''@$+')';.:+'$*@$5:'8''/$.23+'$(-':'(+'8$/B'85'+3'' .$8';,.(+$!(:'),;'@3$+'@''B(,@',6'($+.)$*'1),/'::':'+3'5'/,(+!(.''.(+!*':,;''':,)+',6'8$*$(/'':'$++$!('-'8'+@''('-';$(-'$(-':.11*5'8'+@''('+3''6,)/''@,)B!(2'!('(,(''-!)'/+!,('$(-'+3'',8:+$/*':'!+':'+:'.1'2!(:+'!+:'*6'85'!+:',@('):.*+:',);:!;1*5'85'E3$.:+!,(' ,6'+3'',8?'/+'L'2'@$+')M'.+'$*+3,.23'+3''1),1,)+!,(' ,6'@$+')'*,:+'+,'@$+')')'+$!('-';$5'3$4''/3$(2'-'+3')''!:'(,')'$:,('+,':.11,:''+3$+'+3''*,::'3$:'8''(':+,11'-'$*+,2'+3')' ,:+'*!B'*5'!+'@$:'2)'$+':+'$8:,*.+'*5'$(-'1')3$1:'$*:,')'*$+!4'*5'@3'('+3''*$B''@$:'$8,.+'3$*6'!+:',)!2!($*:!H''@3'('+3')''@$:';,)''3,+'.!)'+3$('8'6,)''$(-';,)'@$+')'+3$('+,-$5' ,@'+3')''!:':,'*!++*''@$+')'+3$+'1,::!8*5'$'*$)2')')'*$+!4':3$)''!:')'/*$!;'-'85'+3''!(+')!,)'/!)/.*$+!,(' □3')''!:'$*:,'+3!:'+,'8''/,(7:!-')'-'+3$+'+3''K.$(+!+5',6',.+:!-''',)'!;1,)+'-'4$1,.)'L,/'$(!/'$(-'('!238,.)7!(2M')'+$!('-'85'+3'' .$8'/$((,+'3$4''-'/)'$:'-' ;./3':!(/''+3''+!;''@3'('+3'' '$',6')$*'3$-'8'/,;'':,':;$**'$:'+,';$B''(,'$11)'/!$8*''-!66')'(/''+,'+3''6$/!*!+!':',6'/,(-'(:$+!,(' :,'+3$+'+3''/,(:+$(+'$;,.(+'2$!(:'!('1),1,)+!,($+''!;1,)+$(/'' ,@'4')'+3!:' ;$5'8''+3')''!:'(,')'$:,('+,':.11,:''+3$+'+3''1),/'::'3$:'/,;''+,'$(' '(-' +';$5'3$4''*,@'-'-,@('/,(:!-')$8*5'8.+'$:'+3''/,(+!('(+$*'/,(-!+!,(:'$)''*!**'+3''*$;''@'' ;$5':.:1'/+'+3$+'+3'5'$)''*!**@,)B!(2'!('+3''-!)'/+!,(' ,6'$'/,;1*'+''-./+!,(' ,6',*-'*$B''*,)':'@3!/3'!:'+$(+$;,.(+'+,'$')'-./+!,(' ,6'+3'')!4'):'$:'+3'5';.:+'6$!*'+,' ;$B''.1'6,)'4$1,)$+!,(' □3':''$)2.;'(+:';$B'';''*,,B'.1,('+3''-':!//$+!,(' ,6'/,(+!7('(+$* :!$'$:'+3''+.)('85'-'4!,.:'@$5:' ,6'+3''@$+')'@3!/3'+3'',/'$(

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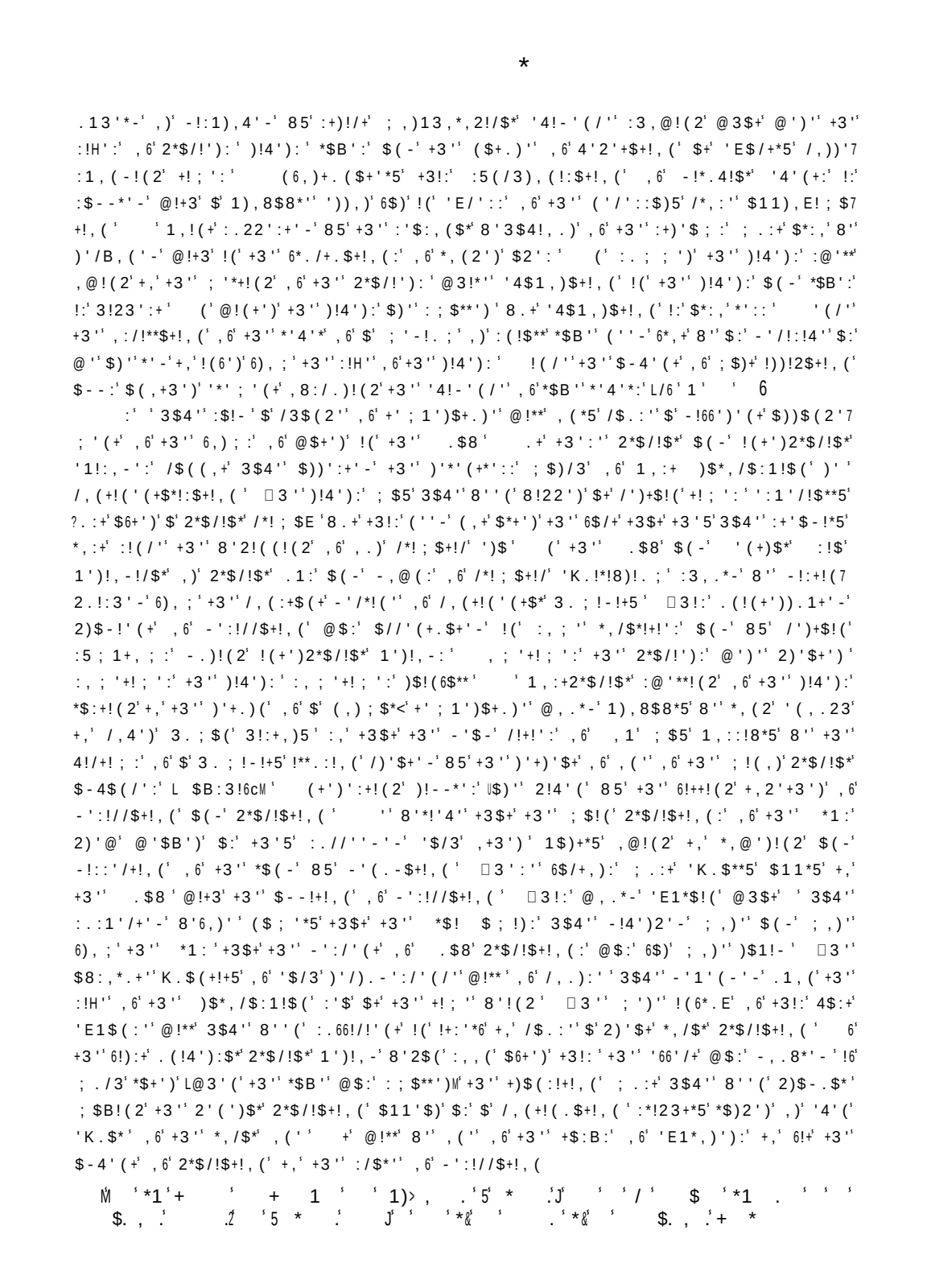

:'+,' '(+)$*' :!$'@''3$-'8':+':$5'+3$+'!+'$*@$5:':+,,-'!('+3'':$;''')'*$+!,('+,'+3'' .$8'$:'(,@':3$)!(2'!+:',/'$(!/':5;1+,;:'+,'$'*'::')'-'2)''' □3'' ,1'8$:!('+3''/'(+)''$(-''E+)';':+')'1)':'(+$+!4'',6'/,(+!('(+$*!+5'@$:'6!**'-'@!+3'@$+')'-')!4'-'6),;'+3''3.;!-!+5':1)'$-'85'+3'')$*,/$:1!$(':'$'8.+':.8:'K.'(+'-':!//$+!,('@$:''4'(;,)'')$1!-'+3$('!('+3'',.+')'8'*+' 6';5':.);!:'':/,))'/+'+3''/,;1$)$+!4''E+'(+',6'2*$/!$+!,(';.:+'3$4''8''(';./3':;$**')'+3$('!('+3'' .$8' +'@!**'3$4'':3,@('!+:'*6';,)'',('+3'':,.+3')(':*,1':',6'□!$(:3$('+3$('!('□!8'+':'1$)$+'-'6),;'+3'':'$',6',1'85'$('',);,.:'-!:+$(/''$(-'1)':'(+!(2'$('$($*,25'+,'+3''1,:!+!,(',6'+3'' $;!):'@!+3')'2$)-'+,'+3'' '$',6')$*' 'B(,@'4')5'*!++*''',6'+3'' ,(2,*!$('*$B':',('@3!/3' /3@$)H'8$:':'3!:'351,+3':!:',6'+3'' *,,-'$(-'-':!//$+!,('' ,8,-5'/$('-'(5'+3$+' /3@$)H9:'!-'$'!:'!(2'(!,.:'$(-'8'$.+!6.*'$:'$'@3,*''$*+3,.23':*!23+*5'6$(+$:+!/'!('-'+$!*')!/'9:')';$)B:',('+3'' H.(2$)!$(' $+''':'';'+,'4!(-!/$+''+3''8'-),/B',6'+3$+'2)'$+':/!'(+!6!/'),;$(/'')!/''LK.,+'-'6),;'-!$)5'!(' $)).+3'):'@ A ' " 5 & 6 2!4':'$('!(+')':+!(2'-':/)!1+!,(',6'+3'' H.(2$)!$(' 2$+'' +3),.23'@3!/3'+3'')$*,/$:1!$($*B3$:3';'-!+')))$('$('88'-'$(-'6*,@'-'*$11!(2'+3''!;',6' '(+)$*' :!$' :'+3'':'$')'+!)'-'6),;'3')''6!):+'$(-'$:'2'(')$*'/,(+!7('(+$*!+5'!:'$(53,@'2)'$+':+'!('+3'';!--*''+3''E+)';':',6'+3''!(+')!,)'$)''$:!*5'.(-'):+,,-'+3),.23'$'/.;.*$+!,(',6''66'/+:' 1'/!$*'+,1,2)$13!/'/!)/.;7:+$(/':'!(+'(:!65'+3''/,(+!('(+$* 13'(,;'(,('',6'!(((');,:+' :!$' '/*,:'')!(2',6'3!23' ;,.(+$!(:' @$)-:',66'+3'' ;,!:+.)''8'$)!(2'@!(-:' ,)',4')'+3':''@$+'):3'-:'+.)('+3'!)':3,)+')'6*$(B:'+,@$)-:'+3''!(:!-'',66')!(2'8.+'*!++*''3!23'*5!(2':.)6$/''+,'/,(-'(:$+!,(' □3$(B:'+,'!+:'*,(2'8)$(/3!(2')$(2':'+3'' .$8'3$:';,)''2*$/!'):'$(-'8'++')'!))!2$+!,(' □3''4')+!/$*'$:'@'**'$:'+3''3,)!H,(+$*+,1,2)$135'$)''/,;8!('-'2!(:+'+3''!(((')'/!)/*''' □3''$//.;.*$+!,(',6'-)5'3'$+':+,)!(2':$(-'@!+3!('+3!:'($)),@':1$/''$*:,'$22)4+':'+3''/*!;$+!/'-':')+'13'(,;'(,(

□3!:'+3'('!:';5'!-'$',6'1),2)'::!4''-':!//$+!,('$(-'!(+')).1+'-'2*$/!$+!,(:''3$4''B'1+'+3';'$:.(-')'6,)'+3'':$B'',6'$'-!$2)$;;$+!/''E1,:!+!,('@!+3,.+'@!:3!(2'+,'-'('5'+3$+'$('!(6*.E'16',.+')'3.;!-!+5'!:'+3!(B$8*''$+'/')+$!('+!;':'$(-'/$('1')3$1:'8''':.11,)+'-'85';'+',),*,2!/$*'$)2.;'(+''':1'/!$**5'!('+3''.$8'@3!/3'!:',1'('!(':'4')$*'-!)'/+!,(:' .+'+3':''@,.*-'8'';!(,)'/,;1*!/$7+!,(:' .(+!(2+,('':1'$B:',6'1*.4!$*'1')!,-:' □3':'',('/$(',(*5'/,(/'!4''$:/,(/.))'(+'@!+3'2*$/!$*'1')!,-:'@3!/3';.:+'(''-:'-'1)'::'4')+!/$**5'$(-'$*:,''E+'(-'3,)!H,(+$**5'+,@$)-:'+3'':'$''6$!*',':''3,@''(+)$*':!$'/$('8'('6!+'85':./3'$'1*.4!$*':+!;.*.:' ,.*-'!+'(,+';$B'';$++'):'@,):''85'$**,@!(2'*'::'4$1,.)'+,'/),::'+3''@$+'):3'-:',@!(2'+,'$'-'1)'::!,('',6'+3''8'*+',6'+3!/B':+':(,@'/*,.-:c'□3!:'$2)'':'@!+3';5'-,.8+06,.(-'-',('';,)13,*,2!/$*')'$:,(:0+3$+')'('@'-'2*$/!$+!,('@!**(,+':3,@'!+:'*6';,:+',('+3''3!23'1$::':',6'$';,.(+$!(':5:+';'(,)',6'/,.):'',('!+:'!3(');,:+'/3$!(:'L $;!):' $:+')(' $./$:.:M'8.+'!('*,@')'$(-',.+')'H,(':6' □3''')'4'):'''$')!:'',6'.(!4'):$*'+';1')$+.)'';$5'1')3$1:

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/$.:'$/+.$*,::+,+3'!(+')!,)')!(2 85$8:+)$/+!,(,6 4$1,.)':,+3$+ +3')'!:
(,2$!(''!+3')'@$5' ('$'/).-'6$:3!,(' +3'':!;!*'',6 $'1,+:.22':+:'!+:'*6
3'('3'$+'-'!+8,!*:',4')'@3!*''/,,*!(2',(*52!4':'+3''('2$+!4''$-4$(+$2'',6'$
:$4!(2'$(-'/,(/'(+)$+!,(',6'+3''@$+')

$4!(2':+$+'-'$'2'(')$*'/$:''''3$**(,@'-!:/.::'$+')$(-,;'$(-'@!+3,.+
1)'?.-!/''4$)!,.:'$:1'/+:',6';,!:+.)''' 6$4,.)!+''13)$:''!:'+3$+',6'+3''E/'::
,6'4$1,)$+!,(',4')'1)'/!1!+$+!,('@3!/3':,!;-:'4')5':!;1*''+3,.23'!+';$5'*'$-
+3''.(@$)5'!(+,';'(+$*+)$1:' □,'!+'@''';.:+'$11*5'+3''*!;!+$+!,(',6'1*$/''$(-
+!;''@3!/3' 3$4''3!(+'-'8'6,)''' +'!:')'$**5'$('E1')!;'(+$* !-'$';'$(!(2
+3$+'!('$'-!:3'E1,:'-'+,'+3''$!)';,)''@$+')'/$('8''4$1,)$+'-'-.)!(2'+3''5'$)
+3$(')$!(6$**@,.*-':.11*5' (' +3'':+'11':'),.(-' $B'')$*'+3''E1')!;'(+$*
'4$1,)$+!,(' !:';,)''+3$('+'('+!;':'$:'2)'$+'$:'1)'/!1!+$+!,(' ,)'4')5'!(/3'
,6')$!(' +3''$!)' & '$8:,)8'+'(' !(/3':',6'@$+')'-.)!(2'+3''*,(2'/*,.-*'::'
!(+')4$*:' .+'+3$+'@$+')'!:'(,+'+3')'' ,'+3!:')'*$+!,(';$5')'4'$*';./3',+,'
.:',)'4')5'*!++*''$//,)-!(2',+,1,2)$135'$(-'-!:+)!8.+!,(',6')$!(' 6')$!(6$**'
$(-''4$1,)$+!,('$)''K.!+''4'(*5':1)'$-',4')'+3''5'$)'$(-',('*'4'*2),.(-'
+3'('$'1')6'/+'8$*$(/''@!+3,.+'-)$!($2''@!**'8'' ':+$8*!:3'-' □3''*'$:+'-),1'
;,)'';.:+').(',66' :'!+'!:''4'('+3''1)':'(+'1,,)')$!(6$**@,.*-'1$)+*5'6,);'
)!4'):'!(+,' E.:'$(-')$*'!6'!+'@')''/),@-'-'!(+,'$'6'@'-$5:' !B'@!:''(,'
'E/'::',6'4$1,)$+!,('3,@'4')'2)'$+'/$(';$B''+3''*'$:+'-!66')'(/''+,'-)5'
:$(-'@3')''+3')''!:'(,+3!(2'+,'4$1,)$+''' '(/''$(',4')8'$)!(2'4$1,)$+!,('
@!+3,.+'-'+$!*'-';,)13,*,2!/$*'$(-':'$:,($*/,;;'(+2!4':'(,'!;;'-!$+'/*.''
+,'+3''35-),2)$135'$(-',+3')'/,(-!+!,(:',6'$')'2!,(' (:$+!:6!'-''4$1,)$+!,('
/$((,+'!(-';(!65'!+:'*6'.(*'::'+3')''!:'4')5';./3'@!(-' +')'K.!)':':.)6$/''
$(-',(*5'@!(-'@!**'($8*''!+',/),@-'!+:'*6'!(+,',+3')':.)6$/':':./3'$:'$B''
)$*'@3')''+3$+'$!)'3$:',8'')';,4'-'@3!/3'!:'$*)'$-5'K.'(/3'-' +'3$:'(,'
:'(:''+,'6,);'$4')$2':'$(-'+,':1'$B',6'$('E/'::'$**',4')'+3'' .$8'@3!/3'
:+)!/+*5':1'$B!(2'@,.*-';'$('+3$+'!+'/,(+$!('-'(,'@$+')'$+'$**' □3''E/'::',6'
'4$1,)$+!,('!('$'/')+$!('*,/$*!+5'!:'$(,+3')'@$5',6':$5!(2'+3$+';./3'3,+'$(-'
-)5'$!)'!:'1),-./'-'+3')'' □3''-':')+';$B':'3,+'$!)'$(-'@!+3'!+:'3'*1'/$('
:1)'$-'!+:'!(6*.'(/''$//,)-!(2'+,'+3''6$/!*!+5'@!+3'@3!/3'+3!:'-':!//$+'-'$!)'!:'
;,8!*!:'-'2!(:+'4!+$*':1,+:',6'/,(-'(:$+!,('3$+'3$:',' 8'')';';8')'-'
!:'+3$+'$'/.8'',6'$!)'@3!/3'/$('$8:,)8'$'/.8!/'!(/3',6'@$+')'$+' '+),'
*'E$(-),4:B'/$((,+'-,'$:';./3'6.)+3')'(,)+3',)'3!23')'.1'!+:'/)$4!(2'
8'!(2'-.**'-'85'/,,*!(2

3')'4')'$!(6$**!:'/,**'/+'-',)'/$(':''1'$@$5'4')5'K.!/B*5'!+'3$:'8''('
)':/.'-'6),;'1,+'(+!$*'4$1,)$+!,('$(-'K.$**5'1,+'(+!$*'4'2'+$+!,('□3!:'
/)'$+':+3''/,(+)$:+'8'+@''('8$)'':*,1':'@3')''4$1,)$+!,('3$:'8''('/3'$+'-'85'
@!+3-)$@$*',6'@$+')'$(-'+3'')!4'):'@3')''!+'!:'-!:$11,!(+'-'85'+3'':;$**:.)6$/''
/,4')!(2'+3''$((.$*/.8!/';!*':',6').((!(2'@$+')' 8,4''+3''1');$('(+':(,@'
!(''+3')''!:'$('$8:,*.+''E/'::',6'1)'/!1!+$+!,('□3.:'+3''6$+'-':')+'@!+3'!+:'
/,(-!+!,(:'!('6$4,.)',6'+,+$*'4$1,)$+!,('!:'-,4'+$!*'-'!(+,'+3''('+@,)B',6

; ,!:+.)' :$4!(2' ; , . (+$!(: ' +' 8 ,+3' '(-:' *!(B'-' 85'). ((!(2')!4'):' @'' 3$4'' +3'' ,*-' :+,)':' +3'' ,('' 1)':')4'-' 85' /,*- ' +3'' ,+3')' $' :.)1*.:' ,4')' '4$1,)$+!,(' !('+3'' *$B' ' '+@'' (' +3'' +@,' -'1$)+ ; '(+:')1./3'/)'-!+!(2'$(-'-'8!+!(2'/$('2,' ,(' @!+3,.+' ! ; 1$!)!(2' +3'' :,*4'(/5',6'+3'' 1$)+(')':3!1' ,(*5' $')'-./+!,(' ,6'+3'' /,; ; ,(' 6.(-' -'(,+!(2'$'*,::'+,' +3'' @3,*'' ,6'+3'' .$8

+' @!**' 1),4'' !(+')':+!(2' +,' /,))'*$+'' +3'' 4$)!,.:' -$+$' ,6')$!(6$**')!4')' -!:/3$)2'' $(-' '4$1,)$+!,(' +' +3'' :$; '' +! ; '' +3'5' @!**' :3,@' 3,@' -'6!/!'(+' ,.)'B(,@*'-2'' :+!**' !:' 3,@'! ; 1,)+$(+' !+' !:' +3$+' $**' ,.)' ,8:')4$+!,(:' :3,.*-' 8'' 1')6'/+*5' /,; 1*'+'' 'K.!4$*'(+' $(-' $-'K.$+'' !6'2.':':@,)B' !:' +,' 8'' 'E/*.-'-' ' 8'2!(' 85'+$8.*$+!(2' +3'' ; ,:+')'*!$8*'' 6!2.)':' 6),;' ')2' +!$((' !/B')' $(-' ,+3'):' , ; '' ,6'+3' ; ' 3$4''),.(-'-',66'4')5'('$)'/$*/.*$+!,(:'8'!(2'-'6'$+'-' !('$(5'/$:'' 85'.(/')+$!(+!':'$(-'2$1:' 3'' ,(*5'$8:,*.+'' 8$:!:'!:'6.)(!:3'-'85' +3'' *,(2')'/,)-:' ,6' .::!$(',8:')4$+,)!':' 6,);!(2',('',6'+3'' 8':+' ; '+',),7 *,2!/$*' :')4!/':' !(' +3'' @,)*-

' ' ' &

' ')2' 3$:' ; $-'' $' :1'/!$*' :+.-5',6' +3!:' !(+')!,)' *$B'' $(-' @)!++'('$(' 'E3$.:+!4'' ; ,(,2)$13

1 & ,':/ *1' . ;' G#2@@@' 4'
$' + ' !G' ':$ 'G? ;
<*.1 '*&' / '!@@@',)'
* ' #E2@@@2@@@',)' '+' ':/*1.'&..' '#@2@@@' ;
' , $'!F@@',)' '+' ,2*'EA',)' '+' %2 41.' *'AF@' %* ' 1&,
,+ *'('!!@' '*'A,)' ': $')/' . % *%.- * ;'
- ' - 1':/' ;'!A@' '*'!!',)' '
- ' 1': ' ;'GF' '*'E',)'
'#A'g ,.*1 . ' '!FBg ,.*1 'G!
+* *'(. '!@G@' ':,* +* $' ' ' ' ' **' ;
1 1': . ;'!"#@' ':,* +* $' ' ' ' 'A@' ;
. '!@AG'h

3'' /,; ; ,(' -!:/3$)2'' ,6' ; .' $(-' !)' ,6' = '/8' B ;' !:' 1),8$8*5' $(' ':+!;$+'' $:'!+'!:' (,+'*!B'*5'+3$+'+3'' ; $(5'-!:+)!8.+$)!':' ,6'+3'' E.:'-'*+$' 3$4'' 8''(' 2$.2'-'' E$/+*5'-.)!(2'$'5'$)' :'+,' '4$1,)$+!,(',('*$B':'@'' B(,@'4')5' *!++*'' $(-'+3'' :$6':+' 1*$(' !:' +,' -'+')!('' !+' 85' ;!(.+'' /,(+),*' ,6'!(6*,@'$(-' ,.+6*,@' $:' $.)')' -!-' @!+3' $B'' C.)!/3' @3')'' 3'' 6,.(-' $(' '4$1,)$+!,(',6' =!A' ; ;' !(' .2.:+' % & % % ' 4$1,)$+!,(' :+$(-:' !(':,;'')$+!,' +,')$!(6$**' $(-' /*,.-!('::' 8.+' :,' 6$)' @'' 3$4'' (,+' 6,.(-' !+' (,)' !:' !+' *!B'*5'+3$+' @'' '4')' :3$**' -!:/,4')' $')'*!$8*'',('':''!(2'+3$+':,' ; ./3' -'1'(-:' .1,(' +3'' '$:,($*' -!:+)!7 8.+!,(',6'4$)!,.:''*' ;'(+:'':1'/!$**5',6'@!(-' ,)',4')'+3')'' !:' $' -!66')'(/'' 8'+@'' (' '4$1,)$+!,(',(' @$+')' $(-'*$(-'8'+@'' (':;$**' $(-'*$)2'' 1,.*:'1,(-:' *$B':' $(-' :@$;1:' :@'' +('::' $(-' $*!(!+5' +' @!**' 3$)-*5' '4')' 6,);' $' +).:+7 @,)+35' /,'66!/!'(+' $11*!/$8*'' +,')'*$+'-' /,(-!+!,(:' :./3' $:' ,+3')' *$B':' !(' ('!238,.)!(2')'2!,(:' **' ;'+',),*,2!/$*' $(-' 35-),2)$13!/$*' ;'$:.)';'(+:

('/'::$)!*5'5!'*-' '4$1,)$+!,(' $:' $' -!6!6')'(/'' $(-' $:' +3':'' -!)'/+' ,8:')4$+!,(:' $)'':,'!;1,)+$(+'!(' ;$(5' -!)'/+!,(:'!+'!:'+3'5'4)3!/3' :3,.*-'8'' ;$-'' 'E+'(-'-' $(-'!;1),4'-' , ;1$)'-'+,'!+:'4,*.;'' +3'')$*' *$B'' !:'4')5' :3$**,@' +3.:' ,66')!(2' $' *$)2'' :.)6$/'' +,' :.(' $(-'$!)' □3'' 'E!:+'(/'' ,6'$' +');!($*' *$B'' !:' 'E1*$!('-'85'+3'' ('' -',6'$('4$1,)$+!(2':.)6$/''6,)')!4'):':+,11'-'85'/,(6!2.)$7 +!,(' ,6'+3'' 2),.(-' □3'' ;!)),)' $*@$5:')'1)'':'(+:'+3'' $)<$')'K.!)'-'6,)'+3'' ':+$8*!:3;'(+',6' $' 8$*$(/'' 8'+@''('!(6*.E'L!(/*.-!(2')$!(',('+3'' :1,+M' $(-' '4$1,)$+!,(' 6'4$1,)$+!,('!(/)'$:':'+3'' *$B'' @!**' :3)!(B'.(+!*' !+' !:',':;$** +3$+' +3'' :.)6$/'' /$((,+' 4$1,)$+'' ;,)'' +3$(' @3$+' /,;'' !(' '(/'' ;./3' -'1'(-:'.1,('+3'':3$1'',6'+3'' 8$:!(' □3'',:/!**$+!,(:',6'$':3$**,@'*$B'' @!+3' 6*$+' 1,,*:'$),.(-'!+:':3,)':'@!**'8'' K.!/B')'$(-' ;,)'' '))$+!/'+3$('+3,:'',6'$' -''1',('':.(B'8'+@''(':+''1'),/B:

4

= $ (* .'BE@@' 9 & * ' .' *'□1 '!#@@' ':, , ' ;(#@@2@@@' 4' & ..'*&') ('#@@' 2'*'"@,)' - ' - 1 'F@@' 2'*'!F',)' <*.1 ' ' 1 1':*+'*&' . ;(F@,)' '+' ':*1) &1.; , $' *' .(#B',)' ',1. *'' ') '(B!2@@@' 4' 2'*'' <*% 3 $ '+. ') .*/') ':,.1 $' ;( )*1'G@@@' 4' ' / 'B2@@@2@@@'+*+1K . *'Ş:

:'@''3$4'',('',8:')4$+!,(:'6,)' 623$(!:+$('+3'')$!(6$**',4')'$8,.+',('3$*6' ,6'+3'' 8$:!(' !:' $'2.'::' .+'!+'/$((,+'8''4')5'6$)'@),(2'.(*'::'$)'$:',6'4')5' ;./3'3!23')'1)'/!1!+$+!,(' 'E!:+',(' +3'':*,1':',6' !(-.B.:3

4

(BF@2@@@' 4' & ..'*&') 9 '#@@' 2'*'AF',)' ':3 % 1.' ' $ ' $;2 - 1 '#"'@' 2'*'"G',)' ' 1 '!FG' 2'*'EB',)' <*.1 ' ' % 1 $ ':' *> ;(!"',)' '+' , $' *' .(!F',)'

□3'' E.:'4,*.;'' $+' .B.:'/$((,+'8''$//'1+'-'$:'$'4')5')''*!$8*'' $4')$2'' 8'!(2'-')!4'-'6),;'$',('5'$)9:',8:')4$+!,('!('%D F_ A' □3'' ;'$:.)';'(+',6' +3'' !)' L%D&&_%& FM' !:'2,,-'8.+'(,+'!;''-!$+'*5'/,;1$)$8*'' ,@!(2'+,'+3'' -!66')'(+'-!:+$(/':'6),;'+3'' ;,.+3:'$(-'+3'' 2)'$+'-'4'*,1;'(+',6'+3'' ;.' -'*+$' ' ;.:+'+3')'6,)'' $//'1+' ')2!:' = '/8'B;' ,6'+,+$*' -!:/3$)2'' !(+,'+3'' *$B'' $:'+3'' 8':+'':+!;$+'' $+' ,.)' -!:1,:$*' 4$1,)$+!,('!('+3'' -'*+$'L:$(-' :@$;1')''-:M' !:'($+.)$**5';./3'3!23')'+3$('!('+3'' *$B'' $(-' ;!23+'1,::!8*5' $;,.(+',' D'/8'B;'@3!/3'@,.*-';'$('$'4,*.;'',6'(,+';,)'' +3$(' = '/8'B;' $+' .B.:' □3!:'!:';,)'' +3$(''(,.23'/,;1$)'-',+'+3'' %F '/8'B;',6'E+)';'

)$!(6$**' ,4')' +3'' 8$:!(' □$B!(2' $' /, (:+$(+' @$+')' *'4'*' +3''!(6*.E' ,6' = ' /8' B; ' !(+,' +3'' '$' ,6')$*' /,))':1, (-:' +,' $(' '4$1,)$+!, (' ,6' F ' ; ; ' +,' @3!/3' ; .:+' 8'' $--'-' +3'' ; '$(')$!(6$**' ,6' !*,' ; ; ' 2!4!(2' $' +,+$*' ,6' DA ' ; ; ' ')2' 3$:' :3,@(' $')!:'' ,6' +3'' *$B'' 6), ; ' %DD ' +,' %& %' $; ,.(+!(2' +,' $(' $4')$2'' ,6' & ' ; ; ' 1')' 5'$)' '' .:':' +3!:' .(-'(!$8*'' 6$/+' $:' $(' $)2.; '(+' 2!(:+' 1),2)':::!4'' -':!//$+!, (' @!+3' @3!/3' , 6' /,.):'' !+' (''-' (,+' 3$4'' $(5+3!(2' +,' -, ' ,' 6$)' !+' 1),4':' (,+3!(2' 8.+' $' 6*./+.$+!, (' $(-' ,(*5' $(,+3')' % ' 5'$):' ,)' :,' ,6' /, (:+$(+' ,8:')4$+!, (' /$(' -!:/*,:'' +3'' /, (+!(.$(/'' ,)' $))':+' ,6' -':!//$+!, (' □3'' B(,@(' 'E+)' ; ':' ,6')$!(6$**' !(' +3'' 8$:!(:' $(-' ,4')' +3'' *$B'' !+:''*6' :.66!/'' +,' 'E1*$!(' /3$(2':' ,6'*'4'*' 85' (,); $*' ,:/!**$+!, (:' L).$/B(')' /5/*':' cM' □3'')!:'' ,6'*'4'*' ,6' ' ; ; ' 3$:' +$B' (' 1*$/'' -.)!(2' ' 5'$):' 8.+' +3'' 1)''/!1!+$+!, (' $*, ('' ,6' $8, .+' :!E' 4')5' @'+' 5'$):' @, .*-' 1), -./'' +3!:' $; ,.(+' ($; '*5e')!:'' ,6'*'4'*' 85' 2)'$+')' !(6*.E' F ' ; ; G' ; ,)'')$!(' 4')' *$B'' A ' ; ; ' ,4')' -'*+$' % ' ; ; G' +,+$*' J ' ; ; ' !(' $' 4')5' @'+' 5'$)' $//,)-!(2' +,')'/,)-:' !(' 3$(-' .+' $:' $' /, (:!-')$8*'')'-./+!, (' ,6' '4$1,)$+!, (' L!(' +3'' *$B'')!4'):' $(-' 8$:!(:M' 3$:' $*:,' +,' 8'' /, (7 :!-')'-' $' /, .1*'' ,6' 'E+)' ; '*5' @'+' $(-' $' (. ; 8')' ,6' ; ,-')$+'*5' @'++')' 5'$):' /$(' '$:!*5' $//, .(+' 6,)' +3'' +,+$*' !(/)'$:'' ,6'*'4'*' □3'' -'*+$' L:.)6$/'' ,' :K' B; M' 3$:' +,' 8'')'; '; 8')'-' $:' ,@!(2' +,' !+:' ('$)('::' $(-' 6$/!*!+!':' ,6' -)$!($2'' !+' ; .:+' :'(-' $+' *':+' ,('' 3$*6' ,6' +3'' 3'$4!')')$!(6$**' !(+,' +3'' *$B'' 1'$B!(2' ,6' +3'' *$B' :'!(' '4$-$' $((')'; $)B:' Q' □3')'' !:' (,' (''-' ,6' $::. ; !(2' $(' E/'::!4'' $.2; '(+$+!, (' ,6')$!(' 6,)' $')'6!**!(2' ,6' +3':'' *$B'' :' ' :, ; '@3$+' 2)'$+')' /*, .-!('::' /, .1*'-' @!+3' $' :*!23+*5' *, @')' +' ; 1')$+.)'' $(-' $' ; .-!/. ; ' ,6' ; ,!:+.)'' @, .*-' :.66!/'' !(' /$.:!(2' $' /, (:!-')$8*'')!:'' 85' :*, @' -'2)'':' 0' ,@' +3'')!:'' ; '(+!, ('-' 85' ')2'!:' $'4')5')$1!-' , (' ' $(-' $:' :./3' :1'$B:' ; ,)'' 2!(:+' +3$(' 6,)' $' /3$(2'' ,6' /*!; $+' ' :!(/'' @'' 3$4'' 8'/, ; '' $//.:+, ; '-' +,' ?.-2!(2' +3'' .(!6,); !+5', 6' $' /*!; $+'' 85' /'(+.)!':' (,+' 85' 5'$):' $(-' -'/$-':' +'!:' !(+')':+!(2' 85' +3'' @$5' +,' +$B'' $' (,+'' ,6' +3'' 6$/+' +3$+' $')!:'' ,6' =' ; ' $8,4'' +3'' %& %' *'4'*' @!**'):+,)'' +3'' , .+6*,@' +3), .23' +3'' H8,!' !(+,' +3'' $:1!$(' □3!:' $--:' 8.+' $(,+3')' /, ; 1*!/$+!, (' +,' +3'' 4$2$)!':' ,6' +3'')$*, /$:1!$(' !(.(-$+!, (' $+' 4$)!, .:' :+$2':' ,6' :3)!(B$2' 5':, ; '', 6' +3'' 1)'/'-!(2' $++' ; 1+:' $+' /$*/.*$+!, (' ' ; ')'*5' @!:3' +,' 1,!(+' ,.+' 3,@' !(+)!/$+!'' +3':'' 1), 8*' ; :' $)'' $(-' 3,@' -'6!/!' (+' +3'' -$+$' $+' ,.)' /, ; ; $(-' □3'' , (*5':,*!-' 8$:!:' !:' 6,); '-' 85' +3'' ; '+',), *, 2!/$*')'/,)-:' □3' 5' $*, (' ':, ' 6$)' 2!4'' $' +).'' 1!/+.)'' , 6' +3'' 4$)!, .:' :'(:!+!4'' $:' @'**' $:' '(')2'+!/' /*!; $+, 7 *, 2!/$*''*' ; '(+:' $(-' , (*5' +3'!)' /, (+!(.$+!, (' /$(')'4'$*' :; $**' :'/.*$)' /3$(2':' :' !**' .% 5 ´F ' >.(''%& AM', (/''$1+*5')' ; $)B'-' Q' /$(' , (*5' 3, 1'' !(' +3'' /, .):'' , 6' $(, +3')' /'(+.)5' ,)' :,' @!+3' +3'' -'4'*, 1; '(+' , 6' +3'' 4')5' 'E/'**' (+' ; '+',), *, 2!/$*' :5:+' ; ' @3!/3' +3'' .:::!$(:' 3$4''!(+), -./'-'!(' +3'' 3'$)+' , 6' :!$' +3')'' @!**' 8'':, ; '' ; ,)'' -'6!(!+'' '4!-'(/'' , (' +3'' :.8?'/+' +,' 8)!(2' 8'6,)'' +3'' ':'$)/3' , ; ; !++'' 0' ' /'(+.)5'!:' 8.+' $':; $**' 6)$/+!, (' , 6' $' 2*$/!$*' :+!**' ; ,)'' , 6' +3-' 1, :+ +')+!$)5' 1')!, -' 8.+' $' 3.(-)'-' 5'$):' , 6' 4')5' 'E$/+' !(:+). ; '(+$*')'/,)-:' @!**' -' ; , (:+)$+'' +3'' :3,)+')' /5/*':' $(-' 1')3$1:' -!:/*,:'' +3'' -!)'/+!, (

,6 $@!-')+'(-'(/5 .)1)':'(+$(-!; ;'-!$+'+3!):+6,)B(,@*'-2' /$(8'2)'$+*5:.11*';'(+'-'85'2',*,25$(-;,)13,*,25$(-'85$//.)$+' :+$+!:+!/:',6 2*$/!'):'*$B':)!4)'4,*.;''-':')+'(/),$/3;'(+1,1.*$+!,(''+/' $B''*'4'* $*,('!:'+3'/,(/'(+)$+'-')':.*+,6$(!(-':/)!8$8*'';!E+.)',6/$.:':'-!:+)!7 8.+'-',4)'@!-''$)'$:'!(/*.-!(2'+3'*,/$*!+5'$(-':3$1'',6'+3'*$B'!+:'*6 (*5 $'4$:+'2',*,2!/$*:3)!(B$2''6),;'*'4'*:'+,'@3!/3'+3')''@$:'(,')'+.)('!:''4!-'(/' ,6'1),+)$/+'-'-':!//$+!,(

,':+.-'(+:',6'135:!,2)$135'@,.*-':.22':+'+3''@,)B!(2',.+',6'!(+)':+!(2 /,;1$)!:,(:':./3'$:'+3$+'8'+@''('+3'' E.:'$(-'+3'' !*'

@ &

'(2+3é +,+$ A 'B;Ć +,' +8$)$ J 'B;
$:!(é D ':K'B;
$!6$** ,6 8$:!(Ć J '/8'B;'L !**M',)'%JF';;
!:/3$)2'é +,,'/8'B;
)'$.(-')'/.*+!4$+!,('!(251+é ':K'B;'8.+ A ':K'B;',6/),1:'L!''':'4')$ 3$)4':+:M
,1.*$+!,(',6 251+ %% é 'E1,)+:'< F Ć !;1,)+:'Ć< F,,,,,Ć '+/''+/

+'@!**'8'':''('+3$+'+3'' !*''-!:/3$)2':',(*5'J'R_<',6'+3'')$!(6$**',6'!+:' /$+/3;'(+'$)'$'@3')'$:' ;.'$(-' !)':$4'' $';./3'*$)2')'1),1,)+!,(' 1$)+ 6),;'+3''*'(2+3',6'+3'')!4')'+3!:'-!:/)'1$(/5'!:'/3!'6*5'-.'',+,',+,1,2)$135'$(-' 4'2'+$+!,(' □3''@$+'):',6'+3'' E.:'8$:!('). ('+,2'+3')'4')5'K.!/B*5'!(+,'+3'!)' :+''1'-)$!($2''/3$((''*:' □3'' !*''8$:!(' !:'6*$+'$(-'6.**',6':@$;1:'$(-'6,)':+:' 6$/+:'+,'8''/,(('/+'-'@!+3'+3''K.':+!,(:',6'!(+')!,)'4$1,.)'/!)/.*$+!,('$(-'+3'' !(6*.'(/'',6'6,)':+:' □3''K.$(+!+!':'*,:+'85'4$1,)$+!,('8'*,@'+3''*$:+'+)!8.+$)5' -,',(,+';$+')!$**5'/3$(2''+3''1),1,)+!,('8'+@''(' E.:'$(-' !*''$:')'2$)-:' +3'!)')'*$+!,(:',6')$!(6$**+,'-!:/3$)2'

.(+!(2+,('3$:'2!4'(' .:'$'@,(-')6.*'-':/)!1+!,(',6'+3''-'$-'/!+!':',6',1' @3')''+3)!4!(2',$:':',6'F':K.$)'' ;!*':'E!:+'-'!(' +3'' □$B*$;B(''-':')+' ('+3';'!('/,(?./+!,('@!+3',+3')'13'(,;'($'3''8$:':'3!:'+3',)5',6'/*!;$+!/' /3$(2''-.)!(2'3!:+,)!/$*+!;':' □,'+3!:',('/$((,+'+$B''E/'1+!,(' +3,.23' @,.*-':*!23+*5';,-!65'3!:'/,(/*.:!,(:' +'!('3$:'$('!-'$',6'3!:',@('@3!/3';$5')'4'$*'$'/,(+)!8.+,)5'/$.:'' '':$5:'+3$+'/,(+!(.$*!))!2$+!,(';.:+')$!:''+3'' *'4'*',6'+3''/.*+!4$+'-'2),.(-'+3''6!'*-:'8'!(2'$($*,2,.:'+,'$'-'*+$'@3')'':!*+'!:' -'1,:!+'-'85'+3''/3'/B!(2',6'+3''/.))'(+' ('+3''/,.):'',6'/'(+.)!':'+3''*$(-' @!**')!:''$8,4''+3''!;',6'+3''$)!B:',+3$+'6!($**5'+3''@$+')'/$((,+',4')6*,@' !(+,'+3''1*,+:' '('@'/$($*'@$:'+3'('; $-''+,'+$1'+3'')!4')'3!23')'.1'):')' :.11*';'(+:'+3!:'4!'@'85':.22':+!(2'+3$+'!('+3!:'@$5'+3''2$)-'('+,@(:'+)$4'**'-' .1:+)'$;'+,@$)-:'+3'';,.(+$!(:' 3$4'' $*)'$-5':$!-'!('+3'' /$:'',6' 2$*!B' L 3$1' M'+3$+'4!**$2':':';'+,'+)$4'*'.1:+)'$;' ./3'@$+')'!('+3'' ,1' 8$:!('!:':!;1*5'@$:+'-'8'/$.:''!+':!(B:'!(+,'+3''2)$4'*'8'*+'$),.(-'+3'6,,+3!**:' /,;!(2',.+'6.)+3')'$@$5'/3$)2'-'@!+3':$*+:'$(-'+3')'6,)''.:'*'::'6,)'$2)!/.*+.)'

+'))!8*' ' 8 .+' ; ,)13 ,*, 2!/$**5' !+' ; $5' 8 '' $' 4 ')5' : ; $**' 66!)' (,+3!(2' 8 .+' $' :*!23+' :3!6+!(2' , 6' +3 '' - ':')+' 6)!(2' ' 6' 6 ,)' : , ; '')'$:, (' ,)' ,+3')' : . /3' $:' +3 '' *$/B' , 6' : . !+$8*'' 2), . (- ' +3')'' $)'' (,' /, (:!- ')$8*'' , .+')' 6!'*-:' $(- ' 2$)- ' (:' +3 '' 3!**' /!+!' :' L' 2' +3 , :'' , 6' !- -*'' , B3$)$M' @!**' $*@$5:')' ; $!(' :+$8*' ' $(- ' (,8 , -5' @ , .*- ' B(, @' $(5+3!(2' , 6' - ':!//$+!, (

□3 '' . $8' !:' /, ; 1, :'- ' , 6' +@ , ' ; '+',), *, 2!/$*' $(- ' 35-), 2)$13!/' 1,)+!, (:' +3 '' 1), - . /+!4 '' $(- ' +3 '' @$:+!(2' ,)' +3 '' ; , . (+$!(:' $(- ' +3 '' - ':')+' $+ .)$**5' +3 '' 8, . (- $)!' :' , 6' +@ , ' 'E+)' ; '')'2!, (:' $)'' $*@$5:' :3!6+!(2' $' *!++*'' +, ' $(- ' 6), ' @!+3 , . +' /$. :!(2' $' /3$(2'' , 6' /, ; 1$)$+!4 '' $)'$:' @,)+3' :1'$B!(2' , 6' . +' :. /3' $' +)!6*!(2' -!:*, /$+!, (' ; $5' /$. :'' $' 2)'$+' 3. ; $(' /$+$:+), 13'' +3')'85' :. 22':+!(2' +3 '' '(,); , . :' $(- ')$1!-' -4(/'' , 6' /')+$!(' /, (-!+!, (:' +3 . :' :''(' +3), . 23' +3 '' :1'/+$/*':' , 6' , .)' 4!+$*' !(+')':+:' □3'')!:B:' , 6' +3'' 6)!(2'' $(- ' /, ; 1'+!+!, (' @!**' -)!4'' +3'' 1, 1. *$+!, (' . 13!**' +, @$)- :' +3'' ,)!2!(' , 6' +3'' @$+'):' □3!:' !:' 1')3$1:' , ('' , 6' +3'')'$:, (:' @35' +3'' ; , . (+$!(:' $)'' :, ' - ' (:'*5' !(3$8!+'-' $:' /, ; 1$)'-' +, ' +3'' $. /$:. :

'+@ ' ' (' +3'' 1, !(+' , 6' - ':!//$+!, (' $(- ' +3'' $*+!+. - '' *! ; !+' , 6' 4'2'+$+!, (' $')!4')' :5:+' ; ' @!**' 8'' $8*'' +, ' :. 11,)+' $' /')+$!(' $; , . (+' , 6' *!6' ' . 11, :!(2' +3$+' +3'' 2), . (- ')' ; $!(:' 'K. $**5' :. !+$8*' ' 4!**$2' :' /$(' 8'' (, .)!:3'- ' $(5@3')'' 8'*, @' +3'' . 11')' *'4'*' , 6' /')'$*:' 3'+3')' +3'' 1, ::!8*'' ; $E!; . ; ' , 6' 3. ; $(' :'++*' ; '(+' !:' $++$!($8*'' ,)' $++$!('- ' - '1'(-:' . 1, (' +3'' @$5' !(' @3!/3' +3'' @$+')' !:' +$11'- ' @3!/3' 2!(' - '1'(-:' . 1, (' +3'' 6,); $+!, (' , 6' +3'' 2), . (- ' □3'' ; ,)'' :/!'(+!6!/' +3'' :5:+' ; ' , 6' !))!2$+!, (' +3'' ('$)')' +3'' ; $E!; . ; ' !:' +3'' K. $(+!+5' , 6' 3. ; $(' *!6'' +3)!4!(2' , (' $' 2!4' (' . (!+' , 6' @$+')' □3'' !- '$' !:' +, ' *'+' +3'' @$+')'). (' $:' :3,)+' $' -!:+$(/'' $:' 1, ::!8*'' @!+3 , .+' 8'!(2' . :'- ' !'' :. 8?'/+' !+' $:' *!++*'' $:' 1, ::!8*'' +, ' -!)''/+' '4$1,)$+!, (' 8'6,)'' !+' +, ./3':' +3''), , +:' , 6' +3'' 1*$(+:' □3'' ; ,)'' /, (/'(7 +)$+'-' +3'' , $:!:' $(- ' +3'' ('$)')' +3'' ; , . (+$!(:' +3'' 8'++')' +3!:' /, (-!+!, (' !:' 6. *6!**'- ' ('' 8!2' /, (('/+'-' $)'$' , 6' 2$)- '(:' !:' ; ,)'' -4(+$2', . :' +3$(' $' *, (2' :+)!(2' , 6' :'++*' ; '(+:' 8'+@ ' ' (' @3!/3' +3'')!4')' !:' 'E1, :'-' +, ' . (1), - ./+!4 '' @$:+' ' ('+3'' :!(2*'' $(- ' /, ; 1$/+' , $:!:' ; ./3' $*:, ' - '1'(-:' . 1, (' !+:' :3$1' ' +3 '' 8':+' 1*$(' 8'!(2' +3$+' , 6' +3'' -!:+)!8. +'-' $(- ')'$::' ; 8*'-' ('+@,)B' , 6' $)+')!' :' $(- ' 4'!(:' +3'' 2$)- '(' 'E1$(-!(2' $+' 6!):+' $(- ' +3'('($)), @!(2' -, @(' 2!(' !('+3'' ; $(')' , 6' +3'' 8$:!('' , 6' $; $)B$(- ' , +' :, ' 2, , -' !:' +3'' :5:+' ; ' @3!/3' 8)$(/3':' , .+' *!B'' $' +)'' ' ':1'/!$**5' @3'(' +3'' ; $!(' $)!B:' 3$4'' +, ' 8'' 4')5' *, (2' 8'6,)'' +3'' 6!'*-:' $)'')'$/3'-' '++')' +3$(' +3!:' !:' +3'' '*, (2$+'-' :3$1'' -!:1, :'-' $*, (2' +3'')!4')' !(' $:+)!1' @!+3' 3'))!(2 8, ('' /3$(('*:' , 1' '$/3' :!-'' +' '(:.)':' +3'' :$; '' ; !(!; . ; ' *, ::' 85' '4$1,)$+!, ($:' +3'' 6!):+' ,)' *, H'(2'' :3$1'-' L)'$::' ; 8*'-M' , $:!:' 8.+' :3$)':' @!+3' +3'' +)'' 1$++')'(' +3'' -!:$-4$(+$2'' , 6' 8*!(-'' (-!(2:' !(' +3'' -':')+' @3')'85' 1), 2)'::!4'' :$*!(!+5' !:' /$. :'-' , (' +3'' , .+')'); ; ' , 6' +3'' , $:!:' @3')'$:' +3'' /!)/. *$+!, (' +51'' -)$!(:' , 66' !+:' :$*+:' 6$)' $@$5' □3'' @,):+' $))$(2' ; '(+' !:' +3$+' , 6' :+)$22*!(2' 1*, +:' 'E1, :!(2' +3'' @$+')' +)$4'**!(2' 8'+@ ' ' (' +3' ; ' □3'' *, @':+' 4!**$2':' :. /3' $:' +3, :'' , 6' $)$B. *' $(- ' , B3$)$' @!**' 8'' 4')5' :' (:!+!4'' $(- ' +3'' 6!):+' +, ' :. 66')' 6), ; ' $' /3$(2'' !(')$!(6$**

*

+3 , . :$ (-ˢ 5 ' $) :ˢ ,)ˢ : , Mˡ +3 ')ʷˢ @ !**ˢ 8 ʷˢ 2*$ / ! ') :ˢ +, ˢ 6 ' ' -ˢ +3 ʷˢ 1) ' : ' (+ˢ (. ; 8 ')ˢ , 6ˢ
! (3$8!+$ (+:ˢ !(ˢ +3 ʷˢ 1*$!(:

(ʷˢ /$ ((, +ˢ : ') ! , . : *5ˢ / , ((' / +ˢ ˢ - ' : ! / / $+! , (ˢ @ !+3ˢ K . ' : +! , (:ˢ , 6ˢ 1) $ / +! / $*ˢ
; , - ') (ˢ $2) ! / . *+ .) ' ˢ . ; $ (! +5ˢ - , ' :ˢ (, +ˢ) ' $**5ˢ 8 , +3 ') ˢ !+ : ' *6ˢ ; . / 3ˢ $8 , . +ˢ @ 3 $ +ˢ
; $5ˢ 3 $ 11 ' (ˢ ! (ˢ $ˢ 3 . (-) ' -ˢ 5 ' $) : ˢ : +! *ˢˢ *' : : ˢ @ 3 $ +ˢ ; $5ˢ 8 ʷˢ +3 ' ˢ / , (- !+! , (:ˢ $ˢ +3 , . : $ (-ˢ
5 ' $) :ˢ 3 ' (/ ' ˢ ˢ : 3 $**ˢ ; ') ' *5ˢ $: Bˢ @ 3 $ +ˢ $) ʷˢ +3 ʷˢ 1) , : 1 ' / +:ˢ , (ˢ +3 ʷˢ 8 $: ! :ˢ , 6ˢ +3 ʷˢ
1) ' : ' (+ˢ @ $+ ') ˢ : . 11*5ˢ □ 3 ' ,) ' +! / $**5ˢ +3 ʷˢ : .) 6$ / ʷˢ , 6ˢ /) , 1 :ˢ / $ (ˢ 8 ʷˢ ! (/) ' $: ' -ˢ $:ˢ
*, (2ˢ $:ˢ +3 ʷˢ ; . -$) 5$ˢ $ (-ˢ !) -$) 5$ˢ) ' $ / 3ˢ $B ʷˢ) $**ˢ - .) ! (2ˢ +3 ʷˢ 4 ' 2 ' +$+! 4 ʷˢ
: ' $: , (ˢ :$4 ʷˢ $ˢ / ') +$! (ˢ $** , @ $ (/ ʷˢ , 6ˢ @ $+ ') ˢ 6 ,) ˢ / $)) 5 ! (2ˢ , *6ˢ : $*! (! +5ˢ . +ˢ , (*5ˢ
!)) ! 2 $+! , (ˢ @ ,) B :ˢ , (ˢ $ˢ 3 . 2 ʷˢ : / $*' ' @ ! **ˢ ' ($8*' ' . :ˢ +, ˢ . +! *! : ' ˢ +3 ' ˢ (, ; ! ($*ˢ ' E / ' : : ˢ $ (-ˢ
! +ˢ) ' ; $! (:ˢ - , . 8 +6 . *ˢ ! 6ˢ +3 ' 5ˢ @ ! **ˢ 1 $ 5ˢ □ $ 11 ! (2ˢ +3 ʷˢ E . : ˢ : $ 5ˢ $ +ˢ 3 $) ? . ! ' @ ! **ˢ 8 ʷˢ
/ , : +*5ˢ ! (ˢ ! +: ' *6ˢ (, +ˢ +, ˢ ; ' (+! , (ˢ +3 ʷˢ ' (,) ; , . :ˢ @ ,) B :ˢ , 6ˢ ' (2 ! (' ') ! (2ˢ (' / ' : : $) 5ˢ
' *: ' @ 3 ') ʷˢ $:ˢ $ˢ - !) ' / +ˢ / , (: ' K . ' (/ ' ˢ □ 3 ʷˢ * , @ ') ! (2ˢ @ $+ ') ˢ * ' 4 ' *ˢ , 6ˢ +3 ʷˢ) ! 4 ') ˢ @ , . *-ˢ
6$! *ˢ +, ˢ) ' $ / 3ˢ +3 ʷˢ / $1+! (2ˢ $) ! B :ˢ , 6ˢ 3 ! 4 $ ' 6 ,) ˢ @ 3 , : ʷˢ 8 ' (' 6 ! +ˢ $ˢ 8 $)) $2 ' ˢ @ , . *-ˢ 3 $ 4 ʷˢ
+, ˢ 8 ʷˢ 8 . ! *+ˢ $ /) , : :ˢ +3 ʷˢ : $ (- 5ˢ $ (-ˢ ; . - - 5ˢ) ! 4 ') ˢ . / 3ˢ ; $5ˢ 1 , : : ! 8 *5ˢ 8 ʷˢ - , (ʷˢ 8 5ˢ
; ,) ʷˢ ! (+' (: ' ˢ ; ' +3 , - :ˢ , 6ˢ 6$) ; ! (2ˢ $ (-ˢ $ˢ : / ! ' (+! 6 ! / ˢ : 5 : +' ; ˢ , 6ˢ @ $+ ') ˢ : $4 ! (2 ˢ . / 3ˢ
; ' +3 , - : ˢ ! 6ˢ 6 ' $: ! 8 *ʷˢ @ ! +3ˢ +3 ʷˢ ($+! 4 ' : ˢ @ ! **ˢ 3 , @ ' 4 ') ˢ * ' $4 ʷˢ $ˢ 4 ') 5ˢ ($)) , @ˢ ; $) 2 ! (ˢ
/ $. : ! (2ˢ $ˢ : +) , (2ˢ) ' $ / +! , (ˢ +, ˢ ' 4 ') 5ˢ 6*. / +. $+! , (ˢ , 6ˢ) $! (6$** ˢ . (*' : : ˢ +3 ʷˢ) ! 4 ') ˢ 4 , *. ; ʷˢ
, 6ˢ +3 ʷˢ -) ! ' : +ˢ 5 ' $) : ˢ ! : ˢ +$B ' (ˢ $: ˢ +3 ʷˢ *! ; !+ ˢ ' (/ ' ˢ +3 ') ʷˢ : ' ' ; :ˢ (, +ˢ ; . / 3ˢ / 3$ (/ ʷˢ
, 6ˢ 2 ' ++! (2ˢ ; ,) ʷˢ 6 , , -ˢ , . +ˢ , 6ˢ +3 ʷˢ . $8 ˢ , ; ' +3 ! (2ˢ ; $5ˢ 8 ʷˢ 2$! (' -ˢ 85ˢ +3 ʷˢ
: . 8 : +!+ . +! , (ˢ , 6ˢ ; ,) ʷˢ 4$* . $8*' ˢ /) , 1 :ˢ 8 . +ˢ $*) ' $ - 5ˢ (, @ˢ / , ++ , (ˢ 3$:ˢ +$B ' (ˢ $@$5ˢ
2) $! (' *$ (- ˢ $ (-ˢ !+ˢ) ' ; $! (:ˢ +, ˢ 8 ʷˢ : ' ' (ˢ ! 6ʷˢ +3 ʷˢ ' E1 ,) +ˢ , 6ˢ / , ++ , (' *' $4 ' :ˢ $ˢ 2 , , -ˢ 1) , 6 ! +ˢ
+, ˢ +3 ʷˢ ($+! 4 ʷˢ 1 , 1 . *$+! , (ˢ $:ˢ $ˢ @ 3 , *' ˢ , 4 ') ˢ +3 ʷˢ ! ; 1 ,) +ˢ , 6ˢ @ 3 ' $+ˢ □ 3 ! :ˢ ; $B ' :ˢ ; ʷˢ
+3 ! (Bˢ +3$+ˢ) $1 ! -ˢ ' / , (, ; ! / ' ! ; 1) , 4 ' ; ' (+ˢ *! ' :ˢ / 3 ! ' 6*5ˢ ! (ˢ +3 ʷˢ -!) ' / +! , (ˢ , 6ˢ) $! *@$5ˢ
! ; 1) , 4 ' ; ' (+:ˢ $ (-ˢ +3 ʷˢ *, @ ') ! (2ˢ , 6ˢ +) $ (: 1 ,) +ˢ) $+ ' :

ˌ ˌ

$ (-ˢ *, ' : :ˢ $ (-ˢ ! / ʷˢ $) ʷˢ +3 ʷˢ ; , :+ˢ +51 ! / $*ˢ / *! ; $+! / ˢ) , / B : # ˢ $ (-ˢ :5 ; 8 , *! : ' :ˢ
+3 ʷˢ 3 ' $+ˢ - ' : ') +ˢ ! / ʷˢ +3 ʷˢ / , *-ˢ - ' : ') +6ˢ *, ' : :ˢ !:ˢ +3 ʷˢ / 3 $) $ / +') ! : +! / ˢ (, (6 ,) ' :+ˢ :, !*ˢ $:ˢ
/ , (+) $: +' -ˢ +, ˢ ; , . *-ˢ $ (-ˢ 1 ' $+

', *, 2! :+:ˢ $) ʷˢ ! (ˢ +3 ʷˢ 3$8! +ˢ , 6ˢ :. ; ;$) ! : ! (2ˢ +3 ' !) ˢ , 8? ' / +:ˢ $:ˢ Q) , / B : 0ˢ E / ' 1+! , (:ˢ $) ʷˢ
: . 22 ' :+' -ˢ 85ˢ 6 ' ' *! (2ˢ $*+3 , . 23ˢ +3 ʷˢ *, 2! / $*ˢ -' 6! (!+! , (ˢ , . 23ˢ +, ˢ ' ; 8) $ / ʷˢ $**ˢ -' $-ˢ ; $+') ˢ +ˢ ; $5ˢ
: ' ' ; ˢ $8 : .) -ˢ +, ˢ / *$: : ! 65ˢ $ˢ / $) / $: ʷˢ $:ˢ $ˢ) , / B ˢ 8 . +ˢ $ˢ 3$8! +. $*ˢ -. ; 1ˢ , 6ˢ -' $-ˢ $ (! ; $*: ˢ !:ˢ ; , :+ˢ
/ ') +$! (*5ˢ $ˢ 2 ' , *, 2! / $*ˢ -' 1 , : !+ˢ ,) ˢ) , / B ˢ ' / , ; 1 , : ! +! , (ˢ $ (-ˢ / 3$ (2 ' ˢ +, ˢ @ 3 ! / 3ˢ ' 4 ' (ˢ 2) $ (! +ʷˢ !:ˢ
: . 8? ' / +ˢ $) ʷˢ $ˢ K . ' : +! , (ˢ , 6ˢ +! ; ʷˢ $ (-ˢ , (ʷˢ @ , . *-ˢ 3$4 ʷˢ +, ˢ : +$+ʷˢ 3 , @ˢ *, (2ˢ $ (ˢ $ / / . ; . *$+! , (ˢ ; . :+ˢ
) ' ; $! (ˢ 135 : ! / $**5ˢ $ (-ˢ / 3 ' ; ! / $**5ˢ :+$8*ʷˢ 8 ' 6 ,) ʷˢ 8 ' ! (2ˢ ' (+ ') ' -ˢ ! (ˢ +3 ʷˢ *! : +ˢ , 6ˢ :+) $+! 2) $13 ! /
, / / .)) ' (/ ' : ˢ *$ / ! ') ˢ ! / ' ' 6 ,) ˢ ! (: +$ (/ ' ' @3 ! / 3ˢ ! :ˢ $ˢ) , / B ˢ) ' ; $! (:ˢ :+) . / +.) $**5ˢ 8 . +ˢ (, +ˢ ; $+') ! $**5ˢ
! - ' (+! / $* ˢ !+! ' :ˢ $) ʷˢ) , / B ˢ 6 ,) ; $+! , (:ˢ 85ˢ +3 ʷˢ : $; ʷˢ) ! 23 +ˢ $:ˢ / ,) $*) ' ' 6 : ˢ P . $)) ' *: ˢ , 4 ') ˢ -' 6 ! (! 7
+! , (:ˢ $) ʷˢ . :. $**5ˢ :+') ! *ʷˢ $:ˢ) ' 2$) -:ˢ +3 ʷˢ ; $+') ˢ , 6ˢ 6$ / +ˢ ! (ˢ !+: ' *6ˢ +3 ʷˢ $: 1 ' / +ˢ , 6ˢ @ 3 ! / 3ˢ !:ˢ ; , :+*5
- ' +') ; ! (' -ˢ 85ˢ @ 3$+ˢ @ ʷˢ @ ! : 3ˢ +, ˢ B (, @ˢ +3$+ˢ !:ˢ +, ˢ : $5ˢ 85ˢ 1) ' / ' - ' (+' 85ˢ +3 ʷˢ 1 .) 1 , : ʷˢ , 6ˢ ! (4 ' : +! 2$7
+! , (ˢ $ (-ˢ +3 ʷˢ ! (:+) . ; ' (+ˢ , 6ˢ , 8 : ') 4$+! , (ˢ . +ˢ +3 ʷˢ 4$*. ʷˢ , 6ˢ -! : / . : : ! , (' *! ' :ˢ ! (ˢ : 3 , @ ! (2ˢ +3 ʷˢ 1 , : : ! 8*ʷˢ
$11*! / $+! , (ˢ , 6ˢ 6$ / +:ˢ +, ˢ $*ˢ +3 ʷˢ -! 66 ') ' (+ˢ 8) $ (/ 3 ' : ˢ , 6ˢ : / ! ' (/ ʷˢ $ (-ˢ ! (ˢ +) $! (! (2ˢ +3 ʷˢ ; ' (+$ˢ ' 5 ʷˢ 6 ,) ˢ $
. (! 4 ') : $ˢ 1 ') : 1 ' / +! 4 ' ˢ □ 3 ʷˢ ; ' +3 , -:ˢ , 6ˢ 2 ' (') $*! : $+! , (ˢ / , (4 ! (/ ʷˢ . :ˢ , 6ˢ +3 ʷˢ ! - ' (+! +5ˢ , 6ˢ +3 ʷˢ *$@ :ˢ
, 6ˢ ($+ .) ʷˢ $ (-ˢ +3 ʷˢ *, 2! / $*ˢ 1) , / ' : : ' :ˢ , 6ˢ +3 ʷˢ 3 . ; $ (ˢ ; ! (-

85' @$+') ' $(-' +3 '' 6.)+3')' (,)+3' @ '' 2, ' +3 '' 2) '$+')' +3 '' :3$)'' ,6' 6*.4!$*' ; .-' .(+!*' 6!($**5' +3 '' 1, ::!8*'' 1')/'(+$2'' ,6',)!2!($*' $!)' -.:+' 8'/, ; ':' $' ; ')'' :1'/.*$+!, (' ('' +') ; ' 3, @'4')' , .23+' +,' -!:$11'$)' 6), ; ' 2', *, 25' ($; '*5' +3$+' ,6' V' :'/, (-$)5' *, ':: 0' *.4!$**5')' 8'--'-'*, ':: '/$((,+' 8'' *, ':: ' $(5' *, (2')' ('!+3')' 2'('+!/$**5' (,)' ; ,)13,*,2!/$**5' , ' 4!:!+' +3'' 8!)+3' ,6' +3'' 6$+3')' .1, (' +3'' (, ; '(/*$+.)'' ,6' :.//''-!(2' 2'(')$+!, (:' !:' $' -$(2'), .:' 1)$/+!/'' @3')'' $:' !(' +3!:' /$:'' +3'' @,)-' Q*, ':: 0' /$(' *'$4'' $' -, .8+' $:' +,' @3'+3')' !+' $11*!':' +,' +3'' 2'(':!:' ,6' +3'' -'1, :!+' ,)' !+:' 1), 2'(!+,)

-; !++!(2' +3'(' +3$+' +3'' *, ':: /*$5' ,6' +3'' !)23!H' :+'11'' !:' 1$)+*5' $', *!/' @'' 3$4'' +,' 6$/'' +3'' 1), 8*'; ' @35' +3'' :$(-' !:' 8'+@''(' +@,' -'1, :!+:' !(' +3'' 6,); $+!, (', 6' @3!/3' @!(-' 1*$5'-' $(' !; 1,)+$(+' 1$)+' :' -.:+' !:' /$))!'-' 6.)+3')' +3$(' :$(-' +3'' /, (/*.:!, (' @, .*-' 8'' +3$+' +3'' .$8' *, ':: '/$; '' 6), ; ' +3'' 2*$/!$*' /'(+)'' , 6' +3'' (,)+3' $(-' +3'' *, ':: /*$5', 6' +3'' !)23!H' :+'11'' 6), ; ' +3'' .$8' ; ,.(+$!(:'' $/3' 8'!(2' :,' +,' :1'$B' :3, +' $/), ::' +3'' ; !--*'' @3')'' +3'' 3'$4!')' :$(-' @$:' -), 11'-' +3')@!:'' @'' :3, .*-' ; ./3' :, , (')' 3$4'' 'E1'/+'-' +@, ' :$(-' 8'*+:' $(-' $' *, ':: $(-' /*$5' -'1, :!+' !(' +3'' ; !--*' □3!:' !:', 6', .):'', (*5' $' 1)!; !+!4'' @$5', 6' :+$+!(2' +3'' 6!($*')':.*+' $:' (,8, -5' @!**:')!, .:*5' 'E1'/+' $')'2.*$)' 'E/3$(2'', 6' +3'' $', *!/' ; $+')!$*6), ; ', 11, :!(2' :!-':' +' !:' ; ')''*5' $' 1!/+.)'' , 6' 3,)!H, (+$* -!:+)!8.+!, (' '' ; .:+' 6!2.)'' +, ' , .):'*4':' $' 2)'$+' /, ; ; , ('6.(-', 6' -.:+' :!6+'-' , .+' , 6' '4')5' !; $2!($8*'' B!(-', 6' -'+)!+.:':.:1'(-'-'!(' +3'' $+; , :13')' ' @!(2' +,' $':+), (2')' @!(-' 1)':.)''6), ; ' +3'' (,)+3' +3'' *$)2')' 1,)+!, (')'; $!('-':, .+3' , 6' $B'')$*' +3'' .$8' +3.:')'+$!(!(2' +3'' ; , :+' , 6' !+:' , @(' /, (+)!8.+!, (' +,' +3'' /, ; ; , ('6.(-')'/''!4!(2' !(' $--!+!, (' $(' 'E+)$' :3$)'' , 6' @3!/3' +3'' .:: !$(' 2*$/!$*' 1*$!(:' 3$-' -'1)!4'-' +3'; :'*4':' □3'' !)23!H' :+'11'' ; .:+' +3')'6,)'' /, (+$!(' $' -!66')'(+!$*')'+.)(', 6' $', *!/' -.:+' '4'(' !6' +3'' 8.*B', 6' !+:'' $)*!')' ; $+')!$* @$:' 6*.4!$+!*'' ,)' *$/.:+)!(''' □3!:', .(-:' 1*$.:!8*'' ' 3, 1'' 8.+' $:' 5'+' !+' !:', (*5' $(' 'E1)'::!, (', 6' +, +$*' '66'/+' '' 3$4'' :+!**' +,' $:B' @35' 1.)'' ,)' $*; , :+' 1.)'' :$(-' :3, .*-' 8'' /, **'/+'-' !(', (''1*$/'' *$::!6!'-' -'1, :!+:', 6' :./3' ; $2(!+.-'' /$(', (*5', //.)' @3')'' @$+')' ,)' @!(-'/, ; '' +,' $' -'$-':+, 1'!(' $' :'$' ,)' !(' /$*; :',)' !(')'*$+!4'' /$*; :' 1), -./'-'85' +3'' 8$*$(/!(2', 6'/.))'(+:' +3')@!:''+)$(:1,)+$+!, (' .:.$**5' 3$11'(:'!(' ; !E+.)':'$(-'85':+$2':' :; $**' :,)+!(2:', .+' $11'$)!(2' !(' K.!'+' :1, +:' '--!':'$(-'.(-')*''':!-':' □3.:'+3'' :!; 1*'' !-'$', 6' +3'' -), 11!(2', .+', 6' +3'' :$(-' /$((, +' :.66!/'' '4'(', (' -!66'')'(+!$*' 2), .(-:' 6,)':$(-' !:' .8!K.!+, .:' 8'!(2' $8*'' +,' +)$4'*' $*; , :+' $(5@3'')'' 85' 6,)@$)-' $(-' .1@$)-' :+'1:' □3'' !H!*B.; ' !:' (,+' 'E$/+*5' $')'2!, (', 6' /$*; :'$(-'!6' 3')'' @!(-' '(')2!':'@')'' ('.+)$*!:'-' +,' 1')6'/+!, (' +3'' *, ':: -.:+', .23+' +,' $//.; .*$+'' ?.:+' $:' @'**' $:' +3'' :$(-' 1$)+' 6), ; ' +3'' '$)*!')')!4')' $(-' *$B'' -'1, :!+!, ('@3!/3' 1)'1$)'-' /, (-!+!, (:' $(-' @3!/3' 2!(' -'1'(-'-', (' 1.)'*5' +, 1, 2)$13!/' /!)/.; :+$(/':' @'' ; .:+' +3')'6,)'' *, , B' .1, (' +3'' 1)':'(+' 1)'/!1!+$+!, (' $(-' B''1!(2' +, 2'+3')' , 6' +3'' :$(-' /3!'6*5'6), ; '$' ('2$+!4'' 1, !(+' , 6' 4!'@' □3'' +). '' /*$::!6!')' !:' 4'2'+$+!, (' $(-' +3'' -':')+' 8'*+' , 6' □.)B':+$(' !:' $('$', *!/' '(/*$4'' .($8*'' +,')'+$!(' -.:+' , @!(2' +,' +3'' $8:'(/'' , 6' $' /*, :'' /), 1' , 6' 2)$::' '' B(, @' +3$+' @$+')' ; , !:+' :.)6$/':' 6,)':+' $(-' 1$:+.)'

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; $++') ,)',4')':$(-'/$(', (*5').('$(-'?. ; 1'@3!*''-.:+'/$('6*,$+'@3!/3'2!4':'!+'+3''1,::!8!*!+5',6':'++*!(2'-,@('4'(*5'□3.:'+3''@'!23+',6':$(-'$*:,'!(6*.'(/':'!+:'2$+3')!(2'+3),.23'+3''/.;.*$+!4''66'/+',6'$'4')5':;$**'8$*$(/''6'/,.):''@'B(,@'+3$+'+3''-':')+':$:'$'@3,*''/$(')$4'*'2$!(!(2'!(/3'85'!(/3'!('+3''-!)'/+!,('6'1)'4$!*!(2'@!(-:'!6'(,+',11,:'-'85'@$+')',):+),(2'4'2'7+$+!,('.+'4'('':,'!+')';$!(:'$:'$'@3,*''$('$)'$',6'-'1)'::!,('6,)'$',*!/':+)$(:1,)+'$:'@'**'$:',('',6')':!-.$*/,(-'(:$+!,('6,)'$',*!/':!6+!(2'□3''5'**,@':'$'$++)$/+:':$(-'$(-')'1'*:'-.:+'□,')':.;''!H!*B.;'!:'$'1*$/''@3')'',6'$**'.$8!/'-'+)!+.:',(*5':$(-')';$!(:'8'/$.:''!+'!:'+3''*,@':+'*$(-'@!+3'+3''-)!':+'/*!;$+''@3')'',@!(2'+,':$*!(!+5'$(-'-),.23+'4'2'+$+!,('!:'1,,)',-.:+')';$!(:'3,@'4')';./3';$5'8''1$::'-'+3),.23'!+'+'!:'$*:,'$'-'1)'::!,(',):+$2($+!,('8'/$.:''$'*!23+'8)''H''@3!/3'@!**'?.:+'/$))5':$(-'-,@(3!**';$5'(,+'*!6+'!+'.13!**'@'!23+'+3.:'$/+!(2'$:'$'1)'4$!*!(2'6$/+,)'!('B''1!(2'+3'':$(-'$+':,;''-!:+$(/'6),;'+3'';,.(+$!(:'□3')''$*:,':'';:'+,'8''$'1)'4$*'(/'',6'@!(-:'8*,@!(2'!(+,'+3''-':')+'□3',)'+!/$**5'+3!:'!:'4')5'*!B'*5':'1'/!$**5'!(':.;;')'@3'('+3''3,+'$!)')!:':'2!4!(2'@$5'+,'.(-')/.))'(+:''!/B')':$5:'Q''-!:/,4')'$'2)'$+'4$)!$8!*!+5',6'+3''@!(-'-!)'/+!,(:'$*,(2'+3''8,.(-$)!':',6';,.(7+$!('$(-':+'11''!('+3'';!--*'',6'+3''.$8'('+3''$((.$*;'$('+3''$@!(-:'$*,(2'+3':''8,.(-$)!':'4'')'$),.(-'+3''/,.(+)5'?.:+'$:'!6'$'8$),;'+)!/';!(!;.;'3$11'('-'+,'8''!('+3'';!--*'O'□3.:',6'$**':$(-'8*,@('.1'$(-'-,@(''!('$(-',.+'$'+!+3''!:'/*$!;'-'85'+3''-':')+(').(-⁹:',1!(!,('-)!6+!(2':$('('$)'$'*,'::'8'*+'!:',(*5'$'1$::!(2':+$2'',6'-':+).(/+!,('+3''6!($*'2',*,2!/$*'1),-./+'8'!(2'*,'::'@3!/3'!:'+3'';,)''1');$('(+'-'1,:!+'',':::'-'1'(-:'.1,('+3''2)!1',6'4'2'+$+!,('@3')'6,)''$',*!/'$//.;.*$7+!,('!:'2'('')$**5'$'13'(,;'(,(',('+3'',.+:B!)+':',6'-':')+':□3''6)!/+!,('$(-'6)!++')!(2',6'3.2'';$:::',6':$(-';.:+'8''$('!;1,)+$(+':,.)/'',6'-.:+':,'+3$+'-':')+'$(-'*,':::'$)'',6+'('/*,:'*5'$::,/!$+'-'.:+'/$('/,;''6),;'$(5@3')''$(-'*,':::'!:'$'6,);',6'-.:+'-'1,:!+!,('6$4,.)'-'85'/')+$!('/*!;$+!/'/,(-!+!,(:').(-'!:')!23+!('$5!(2'+3$+'+3''*,/$+!,(',6'$',*!/':+)$+$'@!+3')'*$+!,('+,'+3'!)1),8$8*''8!)+3'1*$/''!:'(,'-!)'/+'4!-'(/'',6'+3''-!)'/+!,('@3'(/''8*,@'+3''1)'4$!*!(2'@!(-:'□3'':,.)/'',6'+3'';$+')!$*('''-'(,+'8'':,.23+'!('+3''K.$)+')',6'+3'':+),(2')',);,)''6)'K.'(+'$!)'/.))'(+:'6,)'+3''2)$::5':.)6$/'',6'+3''*,'::'/$(')'+$!('-.:+'8),.23+'85'@'$B')',)')$)')'8)''H':'$(-'('''-'(,+'.66')'2)'$+'*,'::'6),;':+),(2')'8.+'/*'$(')'@!(-:

□3''/$:'',6':$(-'!:':,;'@3$+'-!66')'(+'(/'!+'3$:')'$/3'-'+3''*,@*$(-:',)'8''('E1,:'-'+3')''6),;'*$B''8,++,;:',)':'$':3,)':'!+:'8,.(-$)!':'$)'',.+*!('-'85'@!(-:'$(-':*,1':'$:'$*:,'85')!4'):',/'$(:'*$B':'$(-'4'2'+$+!,('□3''6,);$+!,('',6'*,'::'!:'/3!'6*5'8,.(-'+,'+3''1)':'(/'',6'2)$::'3,@'4')';./3'+3''-.:+5'@!(-:';$5'8''!('+3'';!(,)!+5'+'!:'+3')'6,)''8':+'+,':$5'+3$+'*,'::'/,;'':',.+',6'+3''$!)'$(-'+3$+'+3''-.:+'!('+3''$!)'/,;'':'6),;'$(5@3')''),;'+3''2'('+!/':+$(-71,!(+'+3')''!:'$('!;1,)+$(+'-!66')'(/''8'+@''('*,'::'$(-':$(-'!+'8'!(2'@),(2'+,'/$**'8,+3'$',*!/'1),-./+:'@!+3,.+'-!:/)!;!($+!,('.8$')!/':$(-'!:'0 3

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L1$; 1$M' *, ':: ' :' ' 3$4'' 3!(+'-' 8'6,)'' +3'' @3, *'' , 6' +3'' *, ':: ' -, ':' (, +' /, ; '' , .+' , 6' ; ,)$!(':' 8.+' $+' +3'' '(-' , 6' '$/3' 2*$/!$*' $/+!4!+5' +3'' 2)'$+' ; $::':' , 6' 8, .*-')' /*$5'$(-' ; ,)$!(!/'), /B' 6*, .)' 6,); '-' $':+,)'' , 6')'$-5' ; $+')!$*' 6,)' !; ; '7 -!$+'' -!:1'):!, (' '); $(' 2', *, 2!:+:' 8'*!'4' ' +3$+' +3'' *, '::' , 6' !--*'' .), 1'' @$:' 8*, @(' -, @(' 85' (,)+3')*5' @!(-:' 2!(:+' +3'' 6, , +3!**:' $(-' *1:' '3)!(2' 3$:' 6, .(-' +3'' 8, (':' , 6' :+'11'' ; $; ; $*:' !(' '); $(' *, '::' :, ' +3$+' @'' $)'' *'-' +, ' !(6')' +3$+' $' -)!')' /*!; $+'' +3$(' (, @')'!2('-' -.)!(2' 2*$/!$*' !(+')4$*:' , @' :./3' $' 1, :+2*$/!$*' Q' -':!//$+!, (' , 6' .), 1''0' /$; '' $8, .+' ' -, ' (, +' 1), 6':::' +, ' B(, @6 1')3$1:' 8'/$.:'' $:' $((' :$5:' $(' , /'$(!/' /*!; $+'' !:' ; ,)'' :'(:!+!4'' +, ' 6*./+.$7 +!, (:' , 6' :, *$)' 3'$+' +3$(' $' /, (+!('(+$*' , (' 4!-'(+*5' @'' 3$4'' +, '')'$-' Q' /*!; $+'0' 3')'' !(' +3'' :'(:'' , 6' 3.; !-!+5' □3')'' 8'!(2' *!++*'' $8:, *.+'' ; , !:+.)'' !(' /, (7 +!('(+$*' :!$' !+:' K.$(+!+$+!4'' -!:+)!8.+!, (' /$((, +' 8'' :, ':+), (2*5' $66'/+'-' 85' 4$)!$+!, (:' , 6' :.(' +'; 1')$+.)'' □3'' 1, :+2*$/!$*' /*!; $+!/':+$2':' , 6' .), 1'' ; $5' 3$4'' 8''(')$+3')' $8).1+'$(-'+3'' !(+')4$*' , 6' *, '::' :+'11'' ; $5''E1)'::' /, (+)$:+' 8'+@''(' +3'' /, *-' B$(-!($4!$(' 2*$/!'):' $(-' +3'' 3'$+'-' $(-'@!(-:@'1+'!(+')!,)' , 6' +3'' /, (+!('(+' $*, (2' +3'' 6, , +' , 6' +3'' *1:' □3$+' @, .*-' $*:, '1)':'(+' $(' $($*, 25' +, ' +3'' *, ':: ' 8'*+' , 6' +3'' .$8' □3''4')5' ($)), @' :+)!1' , 6' .), 1'$(' *, '::' !:' +3'')''*!/+' , 6' $(' , *-')' /*!; $+'' +3'' $:1'/+' , 6' @3!/3' !:' :+!**' 1)':')4'-' *, /$**5' , (' +3'' $!:'):+.3*'$+' *'$:+' +, ':, ; '' 'E+'(+'85' +3'' 2'(')$*' '66'/+:' , 6' 3'$+' $8:,)1+!, (')$-!$+!, (' 1')/, *$+!, (' -)$!($2'' 4'2'+$+!, (' $(-' +3'' /.*+!4$+!, (' , 6' +3'' 4!('' $(-' @$*(.+

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' 3$4'' , 6+'(' :1, B'(' , 6' +3'' '66'/+:' /$.:'-' 85' +3'' -)5' /*!; $+'' , 6' +3'' .$8' , @' $*+3, .23' +3'' 'E1)'::!, (' !:' /,))'/+*5' $11*!'-' , (' +3'' @3, *'' ' @!:3' +, ' :3, @' +3$+' /*!; $+'' !:' $' :, ; '@3$+' '4$:!4'' /, (/'1+' +, ' 8'' 3$(-*'-' @!+3' -.'' /$.+!, (

'+' .:' 6!):+' , 6' $**' $:B' , .):'*4':' Q @3$+' !:' $' -)5' /*!; $+'c0' □, ' 8'2!(' @!+3' /*!; $+'' ; $5' 8'' -':/)!8'-' $:' +3'' $4')$2'' $((.$*' :+$+'' , 6' +3'' , .+')' :13')'' +3$+' !:' +, ' :$5' +3'' $+; , :13')'' /, ; 8!('-' @!+3' :.(' $(-' /, :; !/' :1$/'' ,)' +3'' :$B'' , 6' :!; 1*!/!+5' @'' :3$**' .(-'):+$(-' $+; , :13')'' $:' !(/*.-!(2' '4')5+3!(2' , .+:!-'' , *$)' '(')25' !+:'*6' !:' $' 6$!)*5' :!; 1*'' 6$/+,)' $:'-'+'); !('-' 85' *$+!+.-'' 8.+' '(,)7 ; , .:*5' 4$)!'-' 85' '$)+3' :.)6$/'' $*+!+.-'' '+/' □3'' :.(9:' -!)'/+' 3'$+' +3')'6,)'')'; $!(:' :'*6.(-'):+, , -' $(-' , .)' /3!'6' /, (/')(' !:' @!+3' !+:' ; , -!6!/$+!, (:' 85' 2', 2)$13!/$*' -!; '(:!, (:' $(-':!+.$+!, (:' □3'':' 2!(' -'+'); !('+3''K.$*!+5' $(-' ; , 4'; '(+:' , 6' +3'' $!)' $8, 4'' +3'; ' 8:+)$/+!(2' 6), ; ' +3'' *!++*'' -!66!/.*+!':' $(-' 'E/'1+!, (:'!(3')'(+' +, ' '4')5' -'6!(!+!, ('@'' ; $5':$5' +3$+' +3'' $+; , :13')'' !:' +3'' 8'$)')' , 6' +3'' /*!; $+'' ,)' 8'++')' :+!**' /*!; $+'' !:' +3'' $4')$2'' $+; , :13')'' '(/'' $' -)5' /*!; $+'' !:' , (' @3!/3' @'' $)'' 1*'$:'-' +, ' -'6!('' $:' -)5' , @!(2' +, ' /')+$!(' K.$*!+!':' , 6' +3'' $!)' /, ; 1$)'-' +, ' :, ; '' :+$(-$)-' :./3' $:' ,)+3')(' .), 1'')!+$!(' ,)' +3'' *1:' ('' 3$:' , (*5' +, ' 8'' , (' , ('9:' 2.$)-' 2!(:' $::, /!$+!, (

8.+3''($;''6+3''/$+$*2.''6+3'';$(5-!66')'(+/(-!+!(:+'8''6,.(-!(+3$+$)'$'':+3''+');'/*!;$+''!:..$**5:.22':+!4''6':,;'':,)+6.(!6,);!+5,)$4')$2''+3''-!66')'(+:'(:''!(@3!/3!+/$('8''.:'-';$5,6+'('8''1),--/+!4'',6@),(2'!;1)'::!,(:+)!/+*5:1'$B!(2',(*5'$'6*,)!:+!/')'2!,('3$:'$'6*,)$'@3!*''+,'8'2!('@!+3'!+3$:':!;1*5'4'2'+$+!,('(*5'$'/*!;$+!/'-!:+)!/+3$:'$'/*!;$+''@3!*''+3')''!:';'+',),*,25'4')5@3')''$)''*5'!:'+3')''/,!(/!-'(/''@!+3!('1,*!+!/$*'$(-',1,2)$13!/$*'8,.(-$)!'':'$:'!('+3''):+!:3':*':'+3''@3,*'',6'@3!/3'6,);'1$)+',6'$'.(!6,);'/*!;$+!/')'2!,('□3''.$8'!:'$'*!++*'';,)''/,;1*'E'8.+').*'-'85'+3'':!;1*''-.$*!:;',6'-':')+'$(-'2*$/!'):'6,);!(2'+@,'/*!;$+!/'/,(+)$:+:',)':13')':',6'!(6*.'(/''□3'',(*5':@''1!(2'2'(')$*!:$+!,('$11*!':'+,'+3'':@$5',6'/,(+!('(+$*!+5'/3!'6*5''E1)'::'-'85'$((.$*'E+)';':'$(-'$)!-!+5'5',(-'+3!:'+3'';'+',),*,2!/$*'135:!,2(,;5',6'+3''.$8';.:+'8''-':/)!8'-'85'$('$($*5:!:',6'!+:'1$)+:'□3'';'(+!,('6'/*!;$+''$:'$'/$.:''!:'8':+':''('!('+3''*!23+',6'$'6!):+'!;1)'::!,('+,'8''/,(4'5'-'$:'$('!(+),-./+,)5'6,);',6':1''/3',1'(!(2'+3''-!:/.::!,(

''/$(',(*5':$5'+3$+'$('!(6*.'(/'',6'/,(+!('(+$*!+5'$(-'-)5('::'L/,;1$)'-'+,'/,))':1,(-!(2':!+.$+!,(:'!('+3')'1*$!(:'$(-';,.(+$!(:M'1')4$-':'+3''(+!)''.$8'.+'$:'+3''@3,*'':!:'/,;1,:'-',6'-!66')'(+'*,/$*'1'/.*!$)!+!':'@''@,.*-',8:/.)''+3':''/3$)$/+')!:+!/'/,(+)$:+:'85'1.:3!(2'+,,'6$)'+3''6,);$+!,('(6'';'$(:''3$4''+3'';,.(+$!(:'$(-'+3''1*$!(:'+3'',$:':'$(-'-':')+:'-)$!($2''$(-'$--./+!,('(6')!4'):'-'6!/!'(/5'(6')$!(6$**'$(-'/,))'/+!,('85'!))!2$+!,('@$(+'(6'@$+')'6,)'$2)!/.*+.)''5'+'$'@$:+''6*,@!(2'.(.:'-'!(+,'+3''4$1,)$+!(2'1$('$+.)*'4'2'+$+!,('-'1'(-':'.1,('+3''):!H''$(-'3'!23+',6'+3'')$(2':'@3'+3')'2*$/!$+'-',)'(,+'+3''*'(2+3',6'+3'!)'/,.):''!(+')/'1+!,('85'!))!2$+!,('$(-':,',(□3''+3',)'+!/$*')$+''6'4$1,)$+!,('!('+3''-':')+'$(-'+3'')!4'):').(((!(2'+3),.23'!+':+$(-'!('(,'/$.:$+!4''')'*$+!,(:3!1'8.+',(*5':')4''+,'-';,(:+)$+''$'/,(+)$-!/+!,('□,':$5'+3$+'+3''/3$)$/+')',6'+3'':+'11':'$(-'+3''$;!):'!:'-.''+,'/*!;$+''';$5',6+'('*'$-',';!:.(-'):+$(-!(2:'6,)'!('+3''6!):+'*!('!+'!:'+3':''1*$/':'+3$+';$B''+3'!)'/*!;$+':'$+'*'$:+'1$)+*5'□3.:',(':3,.*-'+$B''+3!:';,-'',6'+$*B!(2'!('+3''K.$*!+!':',6'+3''.$8'@!+3,.+'1)'?.-!/''$:',','/$.:''!;!*$)*5'$:',+'3''1$:+'+3''6$4,.)!+''13)$:'',6'$'Q/3$(2'',6'/*!;$+'O'!:'8.+'$'1)'*!;!($)5'K.':+!,('!(1)'1$)$+!,(',6':1'/!$*'!(K.!)5

'';.:+*,,B'.1,('/*!;$+'';$!(*5'$:'$('!(-!/$+,)',6'/$.:':'$:'$('!(+');'-!$)5',6'/3$(2':'□3!:')'6'):':1'/!$**5',''+3''*-'1$:+'@3'(/''@'3$4''(,'E$/+';'+',),*,2!/$*',8:')4$+!,(:'@!+3,.+'@3!/3'$'-!)'/+':+.-5',6'/*!;$+'$:'$':/!'(+!6!/',8?'/+'!:'!;1,::!8*''('/''@'';.:+$*@$5:'$:B'@3$+'135:!/$*'/3$(2':'3$4''+$B'('1*$/''$(-'3,@'+3'5'3$4''$66'/+'-'+3''$+;,:13')!/$*'13'(,;'($

'*'('!:H@!$(:B!':$5:'+3$+'+3''-':')+'!''$'6.(/+!,(',6'/*!;$+''.+

;'$:.)';'(+ʻ$(-ʻ-':/)!1+!,(ʻ ʻ2'(')$*ʻ6,)/'ʻ$/+!(2ʻ.1,(ʻ$ʻ1$)+!/.*$)ʻ+3!(2ʻ 8'/,;':ʻ$ʻ1$)+!/.*$)ʻ6,)/'ʻ,)ʻ13'(,;'(,(ʻ 'ʻ;.:+ʻ+3')'6,)'ʻ3$4'ʻ/,;1*'+'ʻ B(,@*'-2'ʻ'!+3')ʻ,6ʻ+3'ʻ+3!(2ʻL$(/!'(+ʻ+,1,2)$135Mʻ$(-ʻ+3'ʻ/,(:+$(+ʻ1)!(/!1*'ʻ L/,:;!/ʻ1')!,-:Mʻ,)ʻ,6ʻ+3'ʻ13'(,;'($ʻ+3';:'*4':ʻL$/+.$*ʻ;'+',),*,2!/$*ʻ,8:')7 4$+!,(ʻ$(-ʻ'E1')!;'(+M ʻ □3'ʻ;'+3,-ʻ,6ʻ-!)'/+ʻ,8:')4$+!,(ʻ!:ʻ'4!-'(+*5ʻ+3'ʻ :!;1*':+ʻ$(-ʻ!+:ʻ1),*,(2$+!,(ʻ!(+,ʻ+3'ʻ6.+.)'ʻ@!**ʻ$*:,ʻ'E+'(-ʻ,.)ʻ)'+),:1'/+ʻ,6ʻ +3'ʻ1$:+ʻ □3!:ʻ3,*-:ʻ2,,-ʻ,6ʻ;'+',),*,25ʻ$(-ʻ2',*,2!/$*ʻ;,)13,*,25ʻ6,)ʻ8,+3ʻ /,;8!('-ʻ;.:+ʻ1),4!-'ʻ.:ʻ@!+3ʻ+3'ʻ1!/+.)'ʻ,6ʻ$(/!'(+ʻ/*!;':ʻ 'ʻ+',),*,25ʻ!:ʻ$ʻ 8)$(/3ʻ,6ʻ;$+3';$+!/$*ʻ135:!/$*ʻ:/!'(/'ʻ.:!(2ʻ+3'ʻ6'$+.)':ʻ,6ʻ'$)+3ʻ$:ʻ$ʻ3.2'ʻ 'E1')!;'(+$*ʻ$11$)$+.:ʻ *!;$+,*,25ʻ!:ʻ$ʻ8)$(/3ʻ,6ʻ/,;1$)$+!4'ʻ2',2)$135ʻ □,-$5ʻ:1'/.*$+!,(ʻ,(ʻ,*-ʻ/*!;$+':ʻ!:ʻ:+!**ʻ'$:5ʻ8'/$.N'ʻ@'ʻ/$((,ʻ$*@$5:ʻ -!:1),4'ʻ!+ʻ@3!*'ʻ'E$/+ʻ)'/,(:+)./+!,(ʻ!:ʻ'E/''-!(2*5ʻ-!66!/.*+ʻ,@!(2ʻ+,ʻ+3'ʻ 1$./!+5ʻ,6ʻ-$+$

ʻ ʻ □

$+!4'ʻ$(-ʻ .:::!$(ʻ($;':ʻ$)'ʻ:1'*+ʻ$//,)-!(2ʻ+,ʻ+3'ʻ:5:+';ʻ,6ʻ+3'ʻ ,5$*ʻ ',2)$13!/$*ʻ ,/!'+5ʻ@3!/3ʻ'4')58,-5ʻ)!+!(2ʻ!(ʻ (2*!:3ʻ,.23+ʻ+,ʻ,8'5ʻ E/'1+!,(:ʻ$)'ʻ;$-'ʻ!(ʻ+3'ʻ/$:'ʻ,6ʻ:./3ʻ@,)-:ʻ$:ʻ3$4'ʻ8'/,;'ʻ6$;!*!$)ʻ+,ʻ)'$-'):ʻ85ʻ*,(2ʻ.:$2'ℓ ''//$ʻ $*/.++$ʻ>'(23!Hʻ 3$(ʻ !)23!Hʻ ')23$($ʻ'+/

'!(2ʻ('!+3')ʻ13!*,*,2!:+ʻ(,)ʻ3!:+,)!$(ʻ8.+ʻ*,,B!(2ʻ$+ʻ;$1:ʻ6),;ʻ$ʻ1.)'*5ʻ +,1,2)$13!/ʻ1,!(+ʻ,6ʻ4!,@ʻ ʻ3$4'ʻ$//'1+'-ʻ@!+3,.+ʻ/)!+!/!:;ʻ+3'ʻ1*$/'ʻ($;':ʻ,6ʻ +3'ʻ .:::!$(',)-($(/'ʻ:.)4'5ʻ (*5ʻ$ʻ4,@'*ʻ3$:ʻ8''(ʻ/3$(2'-ʻ3')'ʻ$(-ʻ+3')'ʻ L ,B3$)$ʻ6,)ʻ .B3$)$Ć C$)$6:3$('6,)ʻC')$6:3$(Mʻ@!3,.ʻ/,(6.:!,(ʻ@$:',.+ʻ,6ʻ+3'ʻ K.':+!,(ʻ +ʻ;.:+ʻ8'ʻB'1+ʻ!(ʻ;!(-ʻ+3$+ʻ$**ʻ:5:+';ʻ:6,)ʻ+3'ʻ:1'**!(2ʻ,6ʻ6,)'!2(ʻ @,)-:ʻ$)'ʻ;')'*5ʻ$11),E!;$+'ʻ3!(+:ʻ+,ʻ+3,:'ʻ@3,ʻ-,ʻ(,+ʻB(,@ʻ+3'ʻ*$(2.$2'ʻ$(ʻ $)+!6!/!$*ʻ 2',2)$13!/$*ʻ :1')$(+,ʻ!(ʻ 6$/+ʻ 4'(ʻ+,ʻ+3'ʻ:/3,*$)ʻ:./3ʻ/,-':ʻ$)'ʻ (,+3!(2ʻ8.+ʻ/,(4'(+!,($*ʻ:!2(:ʻ,)ʻ$!-:ʻ+,ʻ;';,)5ʻ ,ʻ*$(2.$2'ʻ3$:ʻ$(ʻ$8:,7 *.+'*5ʻ6!E'-ʻ:5:+';ʻ*'$:+ʻ,6ʻ$**ʻ6,)ʻ+3'ʻ1',1*'ʻ@3,ʻ:1'$Bʻ!+ʻ+3'5ʻ8'!(2ʻ;,)'ʻ !(-'1'(-'(+ʻ+3),.23ʻ/,(:+$(+ʻ1)$/+!/'ʻ,6ʻ$ʻ)!2!-ʻ4$*.'ʻ,6ʻ*'++')':ʻ$(-ʻ:5**$8*':ʻ ʻ1)$/+!/$**5ʻ*'$)(ʻ+3'ʻ@3,*'ʻ,6ʻ,.)ʻ;,+3')ʻ+,(2.'ʻ85ʻ3'$)+ʻ(,+ʻ$ʻ6'@ʻ).*':ʻ (ʻ(2*!:3ʻ6,)ʻ!(:+$(/'ʻ@'ʻ;.:+ʻ,6+'(ʻ2,ʻ85ʻ+3'ʻ:3$1'ʻ,6ʻ+3'ʻ@3,*'ʻ@,)-ʻ L'(,.23ʻ/,.23ʻ+3),.23Mʻ@3!*'ʻ+3'ʻ1),(./!$+!,(ʻ,6ʻ:,;'ʻ@,)-:ʻ!:ʻ@!+3,.+ʻ 1$)$**'*ʻL2$,*M

□3'ʻ1*$/'ʻ($;':ʻ,6ʻ+3'ʻ .$8ʻ$)'ʻ'!+3')ʻ□.)B!ʻ,)ʻ '):!$(ʻ8.+ʻ8,+3ʻ+3':'ʻ *$(2.$2'ʻ6$;!*!':ʻ$)'ʻ)'1)':'(+'-ʻ85ʻ$ʻ2)'$+ʻ(.;8')ʻ,6ʻ-!$*'/+:ʻ 1$)+ʻ6),;ʻ +3'ʻ6$/+ʻ+3$+ʻ+3'ʻ:$;'ʻ1*$/'ʻ,6+'(ʻ3$:ʻK.!+'ʻ-!66')'(+ʻ($;':ʻ+3')'ʻ$)'ʻ;$(5ʻ 1),(./!$+!,(:ʻ6,)ʻ,('ʻ$(-ʻ+3'ʻ:$;'ʻ*,/$*!+5ʻ$//,)-!(2ʻ+,ʻ+3'ʻ)$/'ʻ,6ʻ+3'ʻ :1'$B')ʻ :'+,ʻ+3'ʻ-!4!:!,(ʻ,)ʻ/,(+)$/+!,(ʻ,6ʻ+3'ʻ1$)+:'ʻ,6ʻ($;':ʻ3$4'ʻ8''(ʻ *'-ʻ85ʻ/,(4'(!'(/'ʻ (*5ʻ +ʻ@,.*-ʻ8'ʻ1'-$(+!/ʻ+,ʻ@)!+'ʻ$*@$5:ʻQʻ.)B3 $8 Oʻ Qʻ 3!(2 ,8 Oʻ@3')'$:ʻ $*$!*!$8!,8ʻ:!;1*5ʻ:3,.+:ʻ6,)ʻ-!::'/+!,(ʻ!(+,ʻQʻ $*$!ʻ *!$8!,8 O

*

$ $:'!('# $;'+!;':' .'$:'!(' .
' $:'!(' # ; :, ; '+!; ':' .'$:'!(' .
! '$:'!(' ; :, ; '+!; ':' '$:'!('
@ $:'!(' ; ,)':3,)+'$:'!('
. $:'!(#$
$! $:'!('
$. :, ; '+!; ':' $$:'!(' 9; 8.+'.:.$**5'
:'1$)$+'' $!''
$*@$5:'3$)-'$:'!('
3 $*@$5:'1),(,.(/'-'$:1!)$+'
B3 /,+/,3' $;(-' '); $(' 2.++.)$*' '$:'!('
,
23 :,6+'2.++.)$*
$*@$5:'$'/,(:,($(+'$:'!('.
5 ;!(' .::!$('@,):
H3)'(/3_',)'?'$:'!(' $
/3'L/3.)/3MG'?'L?,.)($*MG':'L*'::MG':3'L:3$;'MG ,'L4'!*MG'H'LH'$*M'$:'!(' (2*!:3

$;$)B$(-' $H)$+:.*+-(
3$:3;-G' '($.
!8!G' $-!!6'3-?!
,B$(G',('8$:3'%
)$+!.8-' $)!1.*
$!H!)-B' $!H$8--':$)-!
3$.*!' '(-.'L3,@*!' '(,@MG'B$)$.*' □$.;-('
$.*'L $)$,,*' □$,,;-('$,+-M
$(2!8$H-)'L,*-'6,);G'5$(23!M
3$.*!'L3,@*!M
,B3$)-'B3$(-' 3$B3H!(--

$:3$(+-23' B8-23
-$)5$' $B3:.'5.H8$:3!
*'E$(-),4:B
>!H3!B' (-!H3-(

3:3' '3$4'' /,(+)$/+'-'!(+,' :3'L $B:3' $B:3'4$+M

' ('(!('' /$:'':',.+',6'+'('+3'' $//'('+3'' *$:+':5**$8*'',)'+3''+');!($'4,@'*é
;.-$)5-' ');!(-'$(-'$:'!(-!/$+'-'85'@,)-:'$//'(+'-'$8,4'

□ '

('+3''' .$8'+3''' ,(2,*'$(-')5$('*$(2.$2':'$)''+3,),.23*5'; !E'-'$(-'
'4'('6.)+3')'@':+'!+'!:'$'/,;;;,(',//.))'(/''6,)'($;':'+,'8''/,;1,:'-',6'+@,'
-!$*'/+:'L :B! :3')'!(' :!$' !(,)M' ('+3'':;$**'-!/+!,($)!':',6' $)+'L H8'B,'
$)+M'85' $*!4B!('$(-'□$?!B'85' 3$+!;8$5'4'@,)-:',6'8,+3'/*$::':'$11'$)'
3')'4')'/,.*-'+)$/''+3'',)!2!('3$4''1.+'L□M'6,)'□.)B!'';8)$/!(2' ,(2,*'
□.)B!:3' !)23!H' H8'B''+/' ',)'L M'6,)' '):!$('!(/*.-!(2'□$?!B' !(-.:+$(!'
623$('$(-')$8!/')$8!/'3$:'3$-'$'2)'$+'!(6*.'(/'',('+3'' '):!$('*$(2.$2''
$:'@'**' $:',('□.)B!'8'/$.:''+3'' ,(2,*,!-' (,;$-:')'/'!4'-'+3'!)'/!4!*!:$+!,('
+3),.23' '):!$' '(/'' ;,:+'@,)-:'/,((''/+'-'@!+3')'*!2!,('+3'' /$*'(-$)'
:/!'(/''$(-')+'$)''/,;;,('+,'□.)B!:3'$(-' '):!$('-!$*'/+:'8'!(2'2'(')$**5'
-')!4'-'6),;'+3''/,;;,('':,.)/'',6')$8!/' :'+,''+5;,*,25':,;'',6'+3''
($;':'$)''$:!*5')'/,2(!:'-'+3,.23':,;'+!;':',(''3$:'+,'$**,@'6,)'!(6*'/+!,('
85'-'/*'(:!,('L'2' .*!:$(2!(M' .+'+3''*$5;$('3$-'8'++')'(,+'4'(+.)''+,,'
6$)'!('3!:'!(+')1)'+$+!,(:'$:''4'('').-!+'':/3,*$):'6!(-''(,.23'+,'1.HH*''+3';'
'):!$('!:'$'4')5')!/3'*$(2.$2''@!+3'$'4$:+'(.;8')',6'@,)-:',6':!;!*$)':,.(-'
:,'+3$+'$'($;''B(,@('85'+)$(:/)!1+!,(',(*5',6+'('2!4':'(,':$6'' /*.'',+'+3''
,)!'(+$*!:+',)')$+3')';!:*'$-:'3!;'□,'+3!:';.:+'8''$--'-'+3''-')!4$+!,(:'6),;'
,+3')'-!$*'/+:'(,+',:1'$B',6''(-*':'/,)).1+!,(:'@3')'85'$('),)!2!($*'□.)B!'
@,)-';$5'$::.;''+3''$11'$)$(/'',6'$'1')6'/+*5':'*6'4!-'(+' '):!$('($;'' □3''
1,::!8!*!+!':'$)''!('E3$.:+!8*'' □$:3B'(+':'';:'1')6'/+*5'1*$!('$:'Q:+,('/!+5 0'
8.+'!+' ;$5'L,)';$5'(,+M'3$4''8''('3$:3B'(-',)'Q:!E'+,@(:0'L$($*,2!':'
'E$1,*!:'$(?!B'(+'*+!:3$)''-+!:3$)M' ,)'+3':'':$;''')'$:,(:',('';.:+'
(,+'E1'/+'.(!6,);!+5',6':1'**!(2'$(-':+!**'*'::'/,(6,);!+5'8'+@''('/,;;,(

@,)-:ʻ$(-ʻQ,66!/!$*Oʻ ($;ʻ:ʻ,(ʻ ;$1:ʻ$(-ʻ!(ʻ8,,B:ʻ □,1,2)$13'):ʻ3$4'ʻ-!66')'(+ʻ '$):ʻ $(-ʻ -!66')'(+ʻ !(+')1)'+'):ʻ $*+3,.23ʻ +3'5ʻ ;$5ʻ 3$4'ʻ +3'ʻ :$;'ʻ :5:+';ʻ ,6ʻ +)$(:/)!1+!,(ʻ +ʻ !:ʻ!;1,::!8*'ʻ+,ʻ)'/,(/!*'ʻ/,(4'(+!,($*ʻ+,1,2)$135ʻ@!+3ʻ13!*,7 *,25ʻ@!+3,.+ʻ1')1'+.$+!(2ʻ/,(6.:!,(ʻ!(+,ʻ$**ʻ'+')(!+5ʻ ,)ʻ$8,.+ʻ,('ʻ3.(-)'-ʻ ,6ʻ+3'ʻ@,)-:ʻ2!4'(ʻ8'*,@ʻ ʻ$;ʻ!(-'8+'-ʻ+,ʻ (,E9:ʻ%& 4ʻ ʻ% 5 1 ₡

$8ʻL MɆ @$+')')!4')
8-ʻL MɆ /.*+!4$+'-ʻ*$(-'1,1.*,.:
$/3!Bʻ L□MɆ :$*+'8!++')
$-$ʻL□MɆ !:*$(-
2/3ʻL□MɆ +)''
$BʻLS MɆ @3!+'
$*:3')!6₡ (,8*'
$)$8$₲ /$)+
$)$8$B':3₲ -)!4')
$)$*ʻL□MɆ !:*$(-
$)/3$₲?.(!1')ʻ+)''
$)!BʻL□MɆ /$($*
$)+ʻL□MɆ 1$::'/,*
$:3-$3$)ʻL MɆ -)$2,(
$::!$ʻL MɆ ;!**
** ʻ *ʻ -$-$ʻLS MɆ 6$+3')
$+'LSMɆ 3,):'
$.*ʻLS MɆ /$;1
$5$2ʻLS MɆ *,@')'.(-')
8$/3$ʻL MɆ 8,5
8$2ʻLS MɆ 4!**$2'
8$23ʻL MɆ 2$)-'(
8$!'8,!ʻLS MɆ)!/3
8$!2$₲ 2$;'ʻ,('3,):'8$/B
8$*$ʻL MɆ .11')
8$:3ʻLS MɆ 3'$-
8H)ʻL MɆ ;$)B'+
8'2₡ 3!23ʻ,66!/!$*'2,4')(,)
8'*ʻLS MɆ 1$::
8'(-ʻL MɆ -!B''-$;
8!8!ʻL MɆ 2)$(-;,+3')
8.*$BʻLS MɆ :1)!(2
/3$!'/3,!₡ +'$
/3$!B3$($₡ +'$ʻ3,.:'
/3$*;$₡ +.)8$(
/3$1ʻLS MɆ *'6+
/3$1$(₡ ;$*''2,@(
/3$)1,!ʻL (-!$MɆ 8'-:+'$-
/8$:3;$ʻL MɆ :1)!(2
/3!*ʻLS MɆ /3!B,)'1$)+)!-2'
/3!*!;₡ @$+')'1!1'
/3.B.)ʻLS MɆ -''1'2,)2'
/3.*ʻL MɆ -':')+
/3.1$('L MɆ :3'13')-
-$23'+$23'+$.ʻLS MɆ ;,.(+$!(
-$)ʻL MɆ -,,)'1$::$2'
-$)8$(-ʻL MɆ -!66!/.*+ʻ1$::
!]ʻL MɆ 3!23',(2
-$)4$H$ʻL MɆ 2$+'
-$)5$'-$)$ʻL MɆ)!4')
-$:3+ʻL MɆ 1*$!('':+'11'
-$:+.)B3$('L MɆ +$8*'/*,+3'
-4('LS MɆ 1$::
-'3ʻL MɆ 4!**$2'
\ ^]ʻ_5₡+*
-')''-$)$ʻLS MɆ 4$**'5
-':'-$:ʻL MɆ 1*$!(
-.:3$;8$'-.:3$(8'₡ ,(-$5
6)'(2!'6')!(2!ʻL MɆ)$(B' //!-'(+$*
2$)-$('L MɆ ('/B
2$)!('L MɆ 3,+
2.*ʻL MɆ 6*,@')'),:'
2.)ʻLS MɆ +,+$8
^(]*!ʻL MɆ !!Qʻ"*++*^
3$.Hʻ L MɆ)':')4,!)'1,(-
3!::$)'LS MɆ /$:+*'
!::!Bʻ LS MɆ @$);
?$!'!)'LS MɆ 1*$/'':1,+
?!*2$ʻLS MɆ -''1'4$**'5
?.L MɆ :+)'$;
?.;$₡)!-$5
B$8.-ʻL MɆ 8*.'
B$6!)₡ .(8'*!'4')
B$*$'B!*$ʻL MɆ 6,)+)'::
B$*$('B$*,('L MɆ 2)'$+
B$*+$ʻLS MɆ :3,)+
W*/*!A* \ʻ_ ₲A$
B$;!:3ʻLS MɆ)''-:
B$(-'B'(-ʻL MɆ /!+5
W*!LS MɆ + L
B$)$ʻLS MɆ 8*$/B
B$)$1*ʻLS MɆ 2.$)-
B$:3ʻLS MɆ 8$(B'8,)-')
B$++$ʻLS MɆ *$)2'
BH('LS MɆ B'++*'
B$H!ʻL MɆ ?.-2'
B'+;'(₡ 3,'
WS* ʻL MɆ
B3$($ʻL MɆ 3,.:'
B3$)$;'LS MɆ -!)+5'-!:2.:+!(2
B3$+.('LS MɆ @,;$(
B3.(.B'L MɆ /,*-

B3.)?!(G :$--*'8$2
B!/3!B'B/3!B'L□MG :;$**'*!++*'
B!:3*$B'L□MG 4!**$2'
B!H!*'L□MG)'-
B,3'B.23'L MG ;,.(+$!(
B,!'L□MG :3''1
B,B'B.B'2,B'L□MG 8*.''2)''(
B,*'L□MG)$4!('
B,:3'L□MG /$;1!(2'1*$/'
B.*'2,*'L□MG *$B'
B.;'L□MG :$(-
B.)2$('L□MG 3!**'6,)+
B.:3'L MG B!**')
B.:3'L□MG 6$*/,(
B.+$:'L□MG 5$B',E
B.5.'L□MG @'**'/!:+')(
*$B'L MG 1*$/'
*$(2$)'L□MG)':+'3,.:'
;$-)$:$';'-)'::''L) MG /,**'2'
;$!-$('L MG ,1'('1*$/'
;H)'L□MG :$!(+9:'+,;8
;':3'-';$:?!-'L MG ;,:K.'
;!3;,(';'!;$('L□MG 2.':+':+)$(2')
;!($)'L) MG ;!($)'+
;!(28$:3!'L□MG 3'$-',6'$'+3,.:$(-
;!)L MG ;,.(+$!(
;!)$B3.)G :+$8*''8,5''K.'))5
;!)H$'L MG :/)!8'
;,**$3G 1)!':+
;.)2'L MG 6,@*
;.H'L□MG !/''':(,@
($.'L MG ('@
,(8$:3!'L□MG 3'$-',6'+'(
,.',!'L□MG @$+')G 3,**,@
,4$'L□MG 1*$!(
1$*@$('1$*'4$('L MG 3'),'2!$(+
1$(?:3$;8$'1'!:3$;8$G □3.):-$5
1!**$.G -!:3',6')!/''$(-'1!'$+
1.*'L MG 8)!-2'
1.*'L□MG ;,('5
)8+'),8$+'L□MG)':+!(2'1*$/'
)!2!:+$('L MG ;$)B'+'1*$/'
)!:3+$'L□MG +3)'$-
).-'L MG)!4')
:$6!-':'6!-'L MG @3!+'
:$!'L□MG)$4!('
:B*'L□MG 8'$)-
:$*$$;G 2)''+!(2
:$**$':$**!$'L MG +.)8$(
:$;,4$)'L .:: MG 3,+'@$+')'.)(
:$(2'L MG :+,('
:$)':!)'L MG 3'$-':.;;!+
:$)$!'L MG 3,.:'

:$)-'L MG 5'**,@
:$)!B'L□MG 5'**,@
:'8H':!$8H'L MG 2)''(
:'*G :(,@6!'*-'!/'
:3$3)'L MG +,@(
:3$!+$('L MG -'4!*
:3$B3'L□MG 3,)(
:3!B$)!'L MG 3.(+')
:3!)L MG +!2')G ;!*B
:3,)':3.)'L MG :$*!('8)$/B!:3
:3.+.)'L MG /$;'*
:!$'L MG 8*$/B
:!*$.G 1)':'(+'8$B:3!:3
:.'L□MG @$+')
:.)B3'L MG)'-
+$('L M''1*$/'
+$)('L□M'G @$**
+$;$:3$G 6'$:+
+$('L MG ($)),@
+$(2'L MG -'6!*'
+$B3+'L MG +3),('
+$B3+$'L hG 1*$(B
+$:3'L□MG :+,('
+'(2$'+$(B$G $':!*4')'/,;
+'(2!'+$(2G $'1$+3'),$-
+'1''L□MG 3!**
+!B'L□MG :+''1
+!**$G 2,*-
+!;.)'+.;.)'-';!)'L□MG !),(
+!.8!+'B$G /$1
+.2$!'L□MG 8.:35'1*$/'
+.)$G *,)-';$:+')
+.)1$BG /*$5'*,'::
+.+'L MG ;.*8'))5'+)''
.!'L□MG 3,.:'
.*.'.*.23'L□MG 2)'$+'3!23
.)HG 6$:+!(2'+!;'
.)+$'L□MG ;!--*'
.H.('L□MG *,(2'6$)
5$!*$'5$!*$B'$!*$B'*$!*$B'L□MG :.;;')'1$:7
+.)$2'
5$23'5$B'L MG !/''
5B'L□MG 8,.(-$)5'
5$(2!'L□MG ('@'
5$)'L□MG /*!66'8*.66
5$:3!*'5':3!*'L□MG 5'**,@'L$*:,'2)''(cM
5'*!B8$:3!'L□MG 3'$-',6'6!6+5
5,*'L□MG),$-
5.)+'L□MG 6'*+'+'(+
5.H8$:3!'L□MG 3'$-',6'$'3.(-)'-
H$;!('L MG '$)+3
H!(-$('L MG 1)!:,(

1		
5$B	%	8!)
-.		!B!
:'	'	./3
/3,)	&	-.)+
1$(?		8':3
:3!:3	A	,*+!
3$6+	(	5!+!
3$:3+	D	:$B!:
(.	*	+,B.:
-$	%	(
8!:+	'.	!2!);$
:!	'.	,+.:
/3!*	&.	B!)B
1$(?,	)R	5!*!B
:3$:+	A,	,*+;!:3
$6+,-		5!+;!:3
$:3+,-	D	:$B:$(
(4-	&	+,B:$(
:$-	%	5.H
3$H,)	%	;!(2

' :!-':' 'E1*$!(!(2' $' 6'@' ,)-:' +,' +3'' 2'(')$*')'$-')' +3!:' 2*,::$)5' :+$+':+3'' :'(:''!(' @3!/3' ' ' ; 1*,5'/')+$!(' +');:

8)$:!,(' /)$1!(2',6'8),$-' :.)6$/':'/3!'6*5'85'+3'' :'$' $(-'!/' ' (' /,(('/+!,('@!+3' @!(-' Q -'6*$+!,(O' !:' ,6+'(' .:'-

',*!/')!2!($+'-'85',)'$/+'-'.1,('85'@!(-

$*1!('' $(-' *1!(' ' !+3' $' /$1!+$*' Q O' !+')'6'):' +,' 1*$/':' $(-' /,(-!+!,(:' !(' +3'' *1:' +3',:'*4':'@3')'$:' Q $*1!('O' ;'$(:' $B!('+,' +3'' +51'' 6,)' @3!/3' +3'' *1:' 3$4'' 6.)(!:3'-',.)' 6!):+' ,8?'/+' *'::,(' +' !:' $' -':/)!1+!4'' $(-' /,;1$)$+!4'' +');' /,(4'5!(2' /')+$!('!;1)'::!,(:',6'*$(-:/$1'' (,+'$;'($8*'' +8' +)!/+' -'6!(!+!,(' .+'+3'' -!:+!(/+!,('85':1'**!(2'!:'(,+'$*@$5:' ;$-'' !('*!+')$+.)' !B'@!:'' Q' .$8!/O'!:'!('+3'' .$8'@3!*'' Q -.$8!/O' ;$5'8''$(5@3')'' !(' :!$' *:,'/,;1$)'' Q' $;!):'O'$(-'Q'1$;!)O

)'//!$' '/*$:+!/'L! ' '/,;1,:'-',6'6)$2;'(+:M'),/B',6'/,$):'' $ ' 6'//!$:')':.*+'6),;

$**':,)+:',6'2',*,2!/$*'1),/':::'é+',(!/'6)!/+!,('4,*/$(!/';,)$!(!/'$(-'+$*.:'-'1,:!+!,('' +/,(4'/+!,(' !E!(2',6'*$5'):'85'$:/'(-!(2'/.))'(+:

,))$:!,(' /)$1!(2'85'@$+')'@!(-''+/

,))!'',)'/!)K.''3$)$/+')!:+!/':3,)+'4$**'5'!('$';,.(+$!('6*$(B'ć ,6';,)'',)'*'::'3$*6'!)/.*$)'

:3$1''@!+3'4')+!/$*'@$**:' (+!;$+'*5'/,(('/+'-'@!+3'2*$/!$+!,(

,)),:!,(' 3';!/$*'$++$/B',(':.)6$/':

'(.-$+!,(' ':+).//+!,('$(-'*,@')!(2',6'+3''*$(-'85'$+;,:13')!/'$2'(/!':'$(-'+)$(:1,)+'85'@!(-')!4'):'$(-'2*$/!'):

':K.$;$+!,('),-./+!,(',6'1''*:'$1-':/$*':'85'@'$+3')!(2

,*!($' .(('*':3$1'-':!(B3,*'',)':.8:!-'(/'',6'+3'' $):+'K 4

(-,2'(,.:' $(-' E,2'(,.:' /+!(2'6),;'!1:!-'' ,)' ,.+:!-'' □3'' :.(' $(-' $+;,:13')!/'$2'(/!':' $)'' 'E,2'(,.:' @3!*'' +3'' '$)+3%:',@('+';1')$+.)'' L!(6!(!+':!;$*M';,4';'(+:',6'+3'' /).:+'$(-'4,*/$(!/'6,)/':' $)'' '(-,2'(,.:')$4!+5':'' ('$:'$++)$/+!,('!:'' (-,2'(,.:'8.+'4!'@'-'$:'6$**!(2';$++')'L!;1$/+'6),;'$8,4'M'!+';!23+'1$:':'$:''E,2'(,.:

),:!,('.++!(2'-,@('85'@$+')'$(-'!/'

.4!,2$/!$*' □3'' /,**$8,)$+!,(',6'2*$/!'):' $(-')!4'):'8.+';,)'' ':1'/!$**5'+3'' /,(4'):!,(',6';,)$!(!/';$+')!$*'!(+,'$**.4!$*'1'88*''8'-:

*

,)13,*,25' 3,)+ 6,)' 2', ;1)13,*,25' 4')5+3!(2 /,(/')(!(2 +3'' ,.+@$)-' :3$1'' ,6 +3'' '$)+3!:' 6'$+.)':' $(-' +3'!)' ,)!2!('' ',*,25' -''*4':' ;,)'' -''1*5
-4'' (,@ 6!'*-:' ,6 1');$('(+' 3$)-'('-' :(,@' :.$**5 $11*!'-' +,' +3'' *$)2')' 'E1$(:':'
6''-!(2 $ 2*$/!')
.($+$B' '*$+!4'*5 :;$**'),/B5'1'$B 1),+).-!(2 6),;' $ 2)'$+ 'E1$(:'' ,6 2*$/!')
),2)$135' :$;'' $:' ;,.(+$!(' +,1,2)$135
$*$')$)/+!/' ')'2!,(' ,6 H,,2',2)$135' ';8)$/!(2 $ 6$.($,6 /,;;,(' /3$)$/+')!:+!/:' +
/,4'):' +3'' +';1')$+'' H,('' ,6 .),1'' $(-' :!$ 6),;' /'*$(-' +,' '3)!(2 +)$!+' $(-
6),;'+3'' H,)':' +,'>1('!(/*.-!(2+3'' (,)+3')(' 3)$' +3'' 2)'$+')' 1$)+ ,6)$8!$' '):!$'
6223$(!:+$(' $(-'□!8'+
'(!+'(+':' ' 6,);$+!,(' 1'/.*!$)' +,' +3'' ,.+3' ;')!/$(' (-':' □3'' :(,@)6!'*-:' $)'' /.+ .1'
!(+,'),@:' ,6 1)!:;:' ,)' /,('' ,6+'(' :'4')$' 6'+ 3!23
35:!,2)$135' +$(-' 6,)' 135:!/$' 2',2)$135 :'' 1$2'' %=
P.$+')($)5' □3'' *$:+ 2)'$+ 2',*,2!/$' 1')!,-' -!4!-'-'!(+,' 1*'!:+,/'('' ,)' -!*.4!$'% $(-')'/'(+'
1,:+2*$/!$' ,)' $'.4!$*' *+3,.23+3')'' !:' (,'6!E'-' /$*'(-$)' @'' ;$5 :$5 +3$ +3'' *$:+ 2)'$+
2*$/!$+!,(' L3,@ 2)'$+ $(-' @3')'' d ;$)B:' +3'' '(-' ,6 1*'!:+,/'(' (' ;$5 $*:' :$5 +3$
'4')5+3!(2 :+!*' 6,);!(2 L2)$4'* 8'-:' ,6)!4'):'' :/)''':'6)':3 ;,)$!('::' !:')'/'(+' (' +3''
@3,*'' +3')'' !:' (,' 3$)1' -!4!:!,('$(-' Q$*.4!$' ,)')'2'(+0' :!;1*5 ;'$(:' +3'' 1)':'(+ ;,;'(+
,6 2',*,2!/$' +!;':
$!(6$**' :'-'!(' +3'' :$;'' :'(:'' $:' 1)'/!1!+$+!,('!'' !(/*.-!(2 :(,@'-'@' 3,$)'6),:+' 3$!*' '+/
□')+!$)5' ',*,2!/$' 1')!,-' 1)'/'-!(2 +3'' K.$+')($)5' K4
□3'');,;'+')' □3'' :/!'(+!6!/':/$*'!:'-!4!-'-'!(+,'/'(+!2)$-':' K)' % R L '*:!.:M' FR 'K.$*!,'=R
L-$.;.)M ,)' &R L$3)'(3'!+M' '(+!2)$-':' $(-' 3$4'' +3'' :$;'' 6)''H!(2 1,!(+ ,6 R 8.+
J R ' !:' +3'' :$;'' $:' R ,)' R ' :,' +3$+ $6+')' /,(4')+!(2 6),;' ,)'!(+,' ' ,3'' 3$:' +,')'/B,(
6),;' J R ' =%R ' i' R J R i FR
□,)' '),/B5 3!*' 2'(')$**5 !:,*$+'-' !(' +3'' :,.+3 @':+ ,6 (2*$(-
S'),13!*,.:' 1*$(+:' ,)' E'),135+':' $)'' +3,:'' :1'/!$**5 1),+'/+'-' 2!(:+ 3'$+ $(-' 'E/'::!4''
+)$(:1!)$+!,(' !(' -)5')'2!,(:
$-!')5' L!(+');!+'(+M @$+')' /,.):'' ,)')!4')' 8'-' !(' ,)+3' 6)!/$

□ □

@!(2'+,' +3'' /,;1,:!+'' /3$)$/+')'$(-' @!-''')$(2'' ,6' +3'' 8,,B' +3'' /,;1!*$7
+!,(' ,6' +3!:' *!:+' @$:' $;$++')' ,6':,;'' -!66!/.*+5' ' /,;1*'+'' 8!8*!,2)$135' !:'
,.+' ,6' +3'' K.':+!,(' ,@!(2'+,' @$(+' 6':1$/'' (,)' /$(' ' ;'(+!,(' '4')5+3!(2' '
3$4'')'$-'!(' +3'' /,.):'',6' ;5':+.-!':' ,(' !--*'' :!$'$(-' 135:!,2)$135' ,)'
+3':'')'$:,(:' ' 3$4'' ;$-'' @3$+' ;!23+' 8'' /$**'-' $' :.8?'/+!4'' $(-' ;,-')('
L;,:+*5 $6+')' %D& M' *!:+' ,6' +3,:'' @,)B:' $(-' $)+!/*':' @3!/3' !(+')':+'-' ;'' ;,:+'
$(-' @3!/3' +3'')'$-')' 3$:' +3')'6,)'' $')!23+' ,6' B(,@!(2' ('$--!+!,('+,' +3':''
+3')'' $)'' +3'' $.+3,):' @3,;' ' ;.:+' K.,+'' !(' /,(('/+!,('@!+3' :/!'(+!6!/' -$+$'
$(-' +3',)!':' !8*!,2)$13!/$*' *!:+:' ,6')'6')'(/'' $)'' 6,.(-' !(' .)H,(' ;!+)!'4'
$;,(,4')!'-')!/3:'(' '!2')' .(+!(2+,(' $(:-'**' *.6:'(' /3@$)H6 +3''
/,;1*'+':+' .1'+,' %D&F' 8'!(2' !-:B!9:' " & ' ' I0& 5 1 4' ' " &
' '3$4''3$)-*5''4')' ;'(+!,('-'+3'':+$(-$)-' @,)B:' ,6' $.+3,):' @'** B(,@('
+,'+3''1.8*!/',)' +,' '4')5'2',2)$13')' $(-'!+' ;.:+' 8'' +$B'(' 6,)' 2)$(+'-'+3$+' %'
3$4'')'$-',)' .:'-' ;,:+',6' +3'' 135:!,2)$13!/' +'E+8,,B:' $(-'+)$4'*' -':/)!1+!,(:'
85' 8')/),;85' 8).HH!' !+B'(' $**' *$(6,)-' ,(4$*,+').B(')' ,(@$5'
)'-(')' $4!:' '$:5' .+)'.!*' -'' 3!(:' '-/3'(B,' ,):5+3')':36!'*-

.++')')' '!B!'')''*5')'($)-')!:'8$/3' .(+3')' '-!(' '!;' '::'
,*-!/3' .;8,*-+' .E*'5' (-!$(' ,4')(;'(+')$3;')' !++*'-$*'' ,(2:+$66'
5'!)' ')H8$/3')' !/3'**' !**' ,:')' .:3B'+,4' '.;$!)' 8)./3'4' :3$(!('
'(/B' ':/3'*')H3'4$*:B!' $+C'*' !/3+')' !/3+3,6'(' /3*$2!(+@'!+' /3.5*')'
!'4'):' +'!(' .1$('□$!+'□5(-$**' $;8')5' $--'**' $*+3')' ,,-' ,.(2'
3.:8$(-' .*''$(-'+3'*'$-!(2'1')!,-!/$*?,.)($*:',('2',2)$135'2*$/!,*,25'$:'
@<'** $:')!+!:3'$(-' ');$('(/5/*,1$'-!$:

□3'' 2'(')$*)'$-')'-':!),.:',6'2$!(!(2':,;''!(:!23+'!(+,';,-')('2',2)$135'
@3!/3'!:'1)$/+!/$**5'135:!,2)$135'@!**6!(-'3!;'*6')'@$)-'-'85'$':+.-5',6',('
,6'+3)''':;$** $(-'E/'**'(+''*';'(+$)5'4,*.;':'e

' ()□' * + ' , --.' HJ & ' ' @ ' ,(-,(' >,3(' .))$5'
(!4'):!+5' E+'(:!,(' $(.$*:

$ -- /0' , ++ ' / .': 4 &% 5 1 4' ,:+,(' !((' j' ,
*/-1□' ' /++.' @ A' : 4 &% 5 1 4' '@' ,)B'□3'' $/;!**$('
,;1$(5

□3')'' $)'' 6,.)' 8,,B:' $(-',('' $)+!/*'' !(' +3'' (2*!:3'*$(2.$2'' +,'@3!/3'
;5'Q' .$80' ;$5'8'' /,(:!-')'-'$:'6,);!(2'$'/,;1*';'(+' □3'5'$)'' :+),(2*5'
)'/,;;'(-'-'+,'@3,;:,'4')')!:3':'+,',8+$!('$'2,,-':.)4'5',4')'+3''@3,*'',6'
(('),' :!$'@!+3,.+'-!4!(2'+,,'-''1*5'!(+,':'4')$*3.(-)'-@'!23+',6'*!+')$+.)''
□3'!)'1').:$*!:''$:5'$(-'+3'!)'/,(+'(+:'$)''+).:+@,)+35e

2 +)' '34*5 6.'Q□3'' $;!):'$(-'+3'' ,.)/'',6'+3'' E.:0' % 5 1 &
F &' ,*'4!!!' ,(-,('%D&A

' ;,:'+3,),.23')'4!'@',6'4')5+3!(2')'*$+'-'+,'+3'' $;!):' ')5'!(7
+')':+!(2

/ 7'8+/ +.' ' " ' ' ; 3+3'' '/,)-'*&' '>,.)('5'!('
□!8'+'□)$(:3!;$*5$(' (-!$' 3!(':''□.)B':+$(' .::!$('□.)B':+$('$(-' '):!$'
-!(8.)23'j',(-,('%& '*$/B@,,-

□3!:' :1*'(-!-'8,,B'/,4'):' $'@!-'')$(2''6),;' (-!$'+,' '):!$'-':/)!8!(2'
+3''':/'(':'$(-'1',1*':'$*,(2'$'),.+''@3!/3',('(K!23+'/$**'+3''3!:+,)!/$*' $(-'
'+3(,*,2!/$*'$)+')5',6' :!$' ')''+3''')'$-')'@!**6!(-'$'*,(2''E+'(:!,('6'; 5'
)'2!,('!('+3'';,:+'!;1,)+$(+'-!)'/+!,(:' +'!:',('',6'+3'';,:+'-'*!23+6.*' 8,,B:'
,6'+)$4'*' 3$4''4')''(?,5'-':,;'',6'!+:'1$::$2':'6.**',6'1,'+)5'$(-'3.;,.)'
'K.$**!(2';$(5',6'+3''8':+'+3!(2: !1*!(2'4')'@),+'

9-- : + □' ' (6 6) 6.' ': ' ' ' ,(-,('%&% ',(:+$8*'
' 8)!**!$(+'-':/)!1+!,(',6' '(+)$*' :!$'1),1')'!+:'135:!/$*'6'$+.)':'$(-'
/,(-!+!,(:' +'!:'6.**',6'*./!-' 'E1*$($+!,(:'$(-':.22':+!4''!-'$:' □3''2)'$+'
1),8*';',6'-':!//$+!,('!:'+)'$+'-',('$'8),$-'8$:!:'$(-'+3''-'$-'/!+!':',6'+3''
,1'L,)'□$)!;M'8$:!('$)'' :1)'$-',.+',.)'2$H'' P.':+!,(:',6'/*!;$+''
2*$/!$+!,('+3''!(6*.'(/'',6':.)),.(-!(2:'+3''2',2)$13!/'8$:!:',6'3!:+,)5'1),4!-''
6,,-'6,)'+3,.23+

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$*.$8*''$:'$'8,,B',6')'6')'(/''/,(+$!(!(2'$'@'$*+3',6'-'+$!*'-'!(6,);$+!,('
,('$)/3!+'/+.)''$)/3$',*,25'/.:+,;:'3$8!+:')'*!2!,('-)'::''+/',+,2'+3')'@!+3'
$'*$)2''(.!?!8')',6''E/'**'(+'13,+,2)$13:',6''+3(,2)$13!/$*',8?'/+:'$)+'8.!*-!(2:'
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□3''3!:+,)5',6' '(+)$*' :!$' ,B3$)$'$(-' .:::!$('□.)B':+$('!:'3')''1)'7
:'(+'-'85'+@,':/3,*$):'$(-',)!'(+$*!:+:' □3!:' +$(-$)-'@,)B'6,);:'+3''('/'::$)5'
3!:+,)!/$*':.11*';'(+'+,'+3''2',2)$13!/$*'8,,B:' ''*'$)('4')5+3!(2'!;1,)+$(+'
/,(/')(!(2'+3''$)*5',)!2!(:',6'4$)!,.:')$/':'+3'' ,(2,*'!(4$:!,(:'+3''6$+':',6'
-5($:+!':',*-'+)$-''),.+':'@$):'$(-'+3'' ;$)/3',6'+3'' .:::!$('/,(K.':+' □,'
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' □ ' '!:':B!HH'('$.:'□)$(:B$:1!'(' ',2'C+:' '!1H!2' %D&&
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' □ ' *!;$:/3@$(B.(2'(':'!+ % ' ',2' 83' !'(' %D&
>' □ ' .)'*':' ,(+)$-!/+!,(:'-'' 9),:!,(' *$/!$!)'' ' %=' %& A
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' ' ' +)$4'):'*'' ,5$.;'-'□$;')*$('' $)!:' %D&
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' .(-' ' C.)' *!'-').(2'-':' ,::' '>8' !(' ',*' %D&%
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>' ' ,)13,* 2!:/3'f.(-' *$H!$*'' +.-!'(' $.:' ,:(!'(''+/ 83' ' ',2'
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#'$'" % / +--') '0++'+') '1+,2' !+(2+(*'.
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□3 6!):+ 1$)+ ,6 +3!: !(-'E !:' $ /*$::!6!/$+!,(,6:.8?'/+:' @!+3 (.;'),.:/),::)'6')'(/':' +!:'6,**,@'-'85$(' $*13$8'+!/$ *!:+/,(:!:+!(2 /3!'6*5 ,6 1),1')($;':' □3' !:+:',6 ,(+'(+:' **.:+)$+!,(:'$(-' !+')$+.)''$(-'+3' $+!4'$(-' /!'(+!6!/ *,::$)!':'::3,.*-'$*:,'8')'6'))'-'+,' (,(',6@3!/3$)'!(-'E'-

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.$8'é ' (')$ +,1,2)$135' 3$1:' * $(-'!!'=D'66 ,.(-$)!':'!6),2)$135 ='=%D'=DF' F '66'FJ 66 6)'$'=6 $+!+.-'' %A'=DD66 6 /!'(+!6!/'/,(+'(+:' G .::!$(' $1:'J ' &J66' J &66'JF='66'F ' FJF 66 6 $+?!!)'6)!(2'' ' J ' =%D'=DD66'=& G $;'' 'E1*$!('-'!66'G ,B3$)$)':/'(+=DD6 !:+)!/+,6 !--*'' ,B3$)$ =F'##,'=D'F G □,1,2)$135'/*!;$+'' $(-'2*$/!$+!,('F '66'F D66'FJ '66 $)+:',6 :!$'$(-' .$8é:''' *13$8'+ ,)' $1:é 623$(!:+$(' '(+)$*' ((')' !--*'' :!$' *$! $(!!):' $*+!:+$(' ,B3$)$' $./$:.:' 3!($' 3!+)$*' $)@$H' .$8' .)$:!$' ')23$($' .(H$' (-!$')$(' $:32$)!$' $)$+'2!(' $:3;!)' 3!4$',1' 2)' $(?$8' $;!):' ':)!$' ,:3$(' .::!$' !8')!$' ,2-!$($' 3.2($(' □!8'+' □$)!;' 3!(':'' $:+')(' .::!$(' ':+')(' □.)B':+$(' □)$(:/$:1!$' □.)$(' □)$(:,E!$($ $;'':'$(-' *$::!6!/$+!,(é □,1,2)$13!/$ $(-'2',2)$13!/$ ($;':' '%' D 66' &=Dk' JF=!6'J F')')66G .$8'$:'+51'',6 □.)B':+$(' '=DAG *$::!6!/$+!,(',6 2',2)$13!/$ 8,.(-$)!':'J G '(+)$:!$'-'6!('-'%='G ')!13')$ -!:+)!/+:'%='=& G .$8!/'$(-'-.$8!/' *1!('$(-'$*1!('='=DA' /' *,:: ,.(+$!(:'é □,1,2)$135':5:+';:'@$+')3'-:'!'=' 3$1'!!'*566' 'J'AF % % %A %A'66' =J' %'66' A' D&66!'J A66'J '66'J &66' '&'66T ').66T ')&66!JDA'&R&'=!A66'='=66' =F '=FJ'=A '=DF'=DD'F%F' □,+$ $)'$ %AG ,.(+$!(:',6 :!$' G '*$+!4'$(-'$8:,*.+' 3'!23 '=DD'/' *G),2)$13!/$ /'(+)'%'66G $;!):'$:'/'(+)'%A'=D'66G 2'$(-' 2',*,2!/$ /,(+!(.$+!,(:' %' '=66G +)./+.)''-!::'/+!,(' %=A'%FF66' &J'JF 'J %'66' ='66'='%'66'='%A'66'='&'66'==' 66'=F '=D'66'=DF'F F'66' (6*.'(/'',(' +,1,2)$135' :.)),.(-!(2:'*!;$+''4'2'+$+!,('$(!;$*:'$(-';$(' %F'66'%&'J 'J='='F%'F='% A' D=66' &='66'J%'66''''('66'' &'JAA'6'J ''(&''(*'66'=RA'='%'=JA'==66'=A%'66'=D'66'=D'66' =&'!6'F '66'F D66G !'@'6),;' $;$)B$(-'% %'%A G $(-'-':')+'-)5('::'%D&' ='/JJ##,' =A'J%'66'J%='JJ'66'J '=' '=J '=D'66'=& 'F 'F ='## D ' ' $ 'WR'D ' @$+')')!4'):' J'J '=D'66'=D 66'F 66'F D66'H/J## D $:' ' 'J//,'G/HD' & . ' *,2!/$ '66'/+JAA'66'J D=& '66G ++)$/+!,(',)';$('RGD' $ 'JWT,'/OG 3RR'D ,' $:/'(+:'%=A'%=D'66' !(('A' A='&'66'JJ 'J=J'66''&*'J<A'66'3\X'##,'& '66'RJUD' ';8$5'-'D'G ,;'(/*$+.)'' &J66'JF='66G .8-.'-'$(-';!--*'' 3!**:'''('66'=+A'66 /U =9=DJG ,*,)$-,'6,),:'=%A'66'=J 66' $:'$)/3!+'/+.)'' %%&'=%'G □,1,2)$135'$(-' '),:!,('9=JAG □,1,2)$135'$(-'6,)':+=A%66G ,.+3 *1!('*$(-:/$1'&&R''e 58)!-

3!**:'= ' JFb

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, . (+$! (' $; ' :e' :' '" *13$8'+' ,' $1:e' (-':' B3.(' B+$.' *+!(+$23' *1:' *$!'
*$! $; !):' *$+$.' /3!B' B/3.B.)' !'*5' 8),*;$:' 3$1-$)$' 3.*-$!)' $./$:.:'
3$+B$*' 3! ;+$)2$' ,-@!(' .:+'(' $H(!/3' !::-)')$(2'' $H)$+:.*+$('!(-.B.:3'
$H)$+!:3$('!;$*5'2,*' ')$B.+$(' !)+$.'.23!:.)B3' $;/3' 3,(+$23' ./3'
;$(,)' ./3 B$*$(-$)' $:32$)' H' !.*!B3$)4!' .:+$2$+$' .:+$23:' .H?!*2$'
,(+8*$(/' $+'')3,)(' .)$+$' 8)!4' $;!):' '+')' +3'")'$+' $2.($B!' $)!B$.-$*'
'4')+:,4' 3.;B$)$' $(-$*' 3!*8'' '*-!+$.' □!$(:3$(' □.)B':+$(')$(2'' □,4$)8'2'
□$*$:B!' □!)$/3;!)' □$2$);$' $:3$(+$23' $(2!:$8$B' C$)$6:3$(')$(2'
',*,25' .(-)5',//.))'(/':'),/B:''E1,:.)':':+)$+!6!/$+!,(''+/'%=%'66'%FD'%F'% '%DF'
' J '=J':='='F=' =' DA'6%' &J'J D'J% 'J J'JJ=' J=' J=J'JF%' JF=' J ='= ='
= A' =% '=% '=' '=J '==A' =F '=A=' ='6%'6' = A' =D '=DF' , (2*,;')$+'" %D ' '%'
D '=' ' $B3:.'/,(2*,;')$+':'='6!6' .-:1$+'" $:'-'1,:!+' %& ' ,$" D=' *.;'J%=' '
,*-' A ' JFD' =% '='F ' ,*-' 1*$/'):' ,6' $B3:.'-!:+)!/+' = F'6!6' $*+' ==D' ',*,25',6'
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?' 2 6 +/-' , +1□ -)=' /67' @□=)+/1□ ' A) 6

$)2'' '$+.)':e' :'' $*:,' ' ' ' G' 35:!,2)$135',6' .$8' %=' 6!6' =D'66' ')!? 3')$"
-!:+)!/+:' %A'%&' '=&' F%F'G' $;!)' 6)!(2'' ' J '=DD'6%'=&' F J'G' $;!):'$(-' .:+$23:'
%D' $+'):3'-:'%&' !' =' !6'J=J'JF' JF=' JA%'6%'JA=' JDA'=F'=DF'F%F'G (+')!,)'8$:!(:'
%=' 6%'F %' *$+'$.'$(-'1'-':+$" %&' ' J =' 6!6' = F'F A' .8-.'-' 3!**:' JJ'66'=%A'66'=J '
== '6!6' 1$;!)' %'JF=' J =66'=F'=&' 1'$*1' %'J =6!'6' ,*,)$-',6,);':'$(-' $B3:.'
/,(2*,;')$+':'=J'6%'=' .+3' *1!('',)' ,B3$)$+51'',6'*$(-:/$1'' L3!**:M == '6*6' '"
$*:,' ,B3$)$' $;!):'□.1/3'B''+/
'(')$*' 35:!,2)$135e' :'" $*:,' ' G' 66'/+',6' /*!;$+'" $(-' 4'2'+$+!,(' %JD' %& ' J ='
J% '6!6' = J' '=D' '=&D' $' F D'6!6' F =' $ G .:'.;',6' ($+.)'" =% '%D&' $' G *';'(+$)5'
$(-:/$1'' %&J' (6.'(/'',6'*,':' J&'=J '=',6!6' F =' 66 G !**:',6' $//.;.*$+!,('+/' D='
= ' ;8$5'-' ;,.(+$!(:' D ')/3$',*,2!/$" /3$)$/+')!:+!/:' %& JJ 66'JF=DD'J =AD=F=%AAD'=JAD'
== '66'=F'66'=D'66'=&F'66'F%F' *$/!')' @,)B' /,;1$)'-'+,')!4')' @,)B FADD' AJ' J%'
J %'66'=JA' (+')$/+!,(',6'1),/':':'J%'=DA'J %'66'= 'F A'F DAD' 3$1'',6'$4$*$(/3':'
;.-:1$+':'2*$/!'):'+/' %&A'6!6' %&&' J=' 66'6' ($*,25',6':$@' ' +)$+!6!/$+!,('/*'$4$2'"
J=F'66'=% DD'= '6!6' '(/!**'-':*$+" J= ' !,*,2!/$" *!;!+:',6'1$;!):' J ' $+$:+),13':'
J&D'66'= '66' $+'):3'-'-!/3,+,;5'= F' '3$4!,.)',6),/B:'+,@$)-:'$2'(/!':'= J'6!6'=JA'
= '= ='6!6' $))!'):',6' $(-.:3B$'J'= &'66' '1,:!+:'@'+'$(-'-)5'=D=' (+!/*!($" 4$**'5'
= A' 58)!-'3!**:'=
.)6$/':'$(-' 3$1':e' :'" $*:,' G' $)-':,!" %&&' JJ '= ='=DJ' ,*,.)!(2' %DA'%DD' = '
&J!'J%='&'66M J '(&'= A'=D='66' 3$1':'%F '%D ' DJ' J D' J%='J%A' J=%'&'' '&(
= ='=% '= JDD'==A'==D'=AF'=ADDD'&(&'66' !(B3,*':'1,/B'+'*$B':' F=AD' AD' J=%'J=A'
J&F' ==A' '*+'-'6.)),@:'*!,(9:' 1$@:' %& '=A' J F' J=%' .++!(2:' A '=F' .)6$/'"
6,);$+!,(:' J D' J=J' JA DD'= ='=% '=% '== '=A%'66'=AD'= $)+3' 1!**$):'%D 'J%A'= F'
=AAe' ,!" $(-'6,)':+=J '=A%'66'=&DDD
!)/.*$+!,(:e' :'" $*:,' G .(-)5'/!)/.*$+!,(:' &DD'=&&AD' F D66' F =DD' ;1,)+$(/'',6
:1'/!6!/+/!)/.*$+!,(:' F'66'=&&e' ,':':'$(-'@$+')'*'66'F ='66')$!($2'"='%='66' J' =J'66'
J ='J A'!6'JAJAD'J&F'= ='=J='=A%'66'F D'66
'$+3')!(2'$(-' '(.-$+!,(e' %FA' = 66'JJD'J ' = ='=A%AD'= =DD' =DJAD'=DADD'
=&DDD'F =AD' 2!(:+'),:!,(' = AD' ,6'8.!*-!(2:'% J' ,6'),/B:'%F AD'%F AD' DA' &J'
J%J' J ' = =AD' = =AD'=DJDA' $!(8,@'2)!+' J AD
),:!,(e' :'" $*:,' ' G %=J'%D='%&%' J O F'J% 'J%A'J ' J 'JJ JA 'J %'AD'(,'*'66'
= ='=! 66' =%AAD' = JAD' =J=AD' ==AA' =F ' =AJ' =AAA ' = A' =D AD' =&D' F AA' F &'
$:'" *'4'+' /'&' ==' JA A' JD' $(-')!4')' 2)$-'" AA' '$-@$)-' 2),@+3' -&'' = ' '<R'
JA'66' F 'AD' -!)'/+'-' 85' +,1,2)$135' =J=

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$B ' : e ' =& ' DA6 ' % ' F%66 ' J% ' J ,66 ' JA=' =A ' =D=' F 6 ' :!,6 ' F%&kc G $; ,(2 -.(' :' DAG ; ,)$!(!/ % ' !66 ' & ' J A66 ' J ' J==66 ' JA=' =A G 3,)'*!(' J ' F!D66
$B ' $; ' :e :'' *13$8'+ ,)' $1:G)$*,/$:1!$(')$*' $*B3$:3' '(2!H B.*' :B$(-')' .)8$(B.*' $)$B.*' ,:3' . B.*$(' ,1' $B3$(' $:).-' $(2 B.*' 3$B3 ! ; $-$(' □! ; .) -')$ B.*' □:$!-$; ' $:3!*B.*' C,)B.*

' 6 :B 2-/ + ' /67' , +/ 6

(,@e' :'' $*:,' G JF=' =AFG (,@' *!('' %FJkc ' %FF' % A' '((' 66 ' =% ' =%D' =&F' :,,66 ' F, 66G (,@ 6!'*-:' (A4A' !/'' ;$(+*'' %F ' % A'66' % ' & ' J &'66 ' J% ' JJA' JAF' J %'66 ' = =' =% ' F '66 ' F FG 4$*$(/3':' %&=' A ' A' J A' J==' 66 ' JAF' =A '66 ' =D=G (,@ 1)'::.)'' %FF' J=% ' J =' = &' =% G '-' :(,@ =G ;8)5,(!/ /,))!':' ,)' 3$*6 ;,,(' ;$)B!(2:' = &' =% *$/!')cé %A' =' = '66 ' =' A' J% ' J%J' 66 ' J A' J=%' 66 ' J=A' 66 ' J=D' JF ' JFF' 66 ' JFD' JA '66 ' JAF' 66 ' J %'66 ' 3$1' 5 , ' = =' =% ' = ' =D '66 ' F '66 G ,6 □!8'+ %A' F J' F%FG ''-' ,6 ;$1:')' = F' F G *$/!')' @$+')' %JA' = ' F D66 G $(-' /*!;$+'' :'' $*:,' JF' D& ' 11'(-!EG !)+ 2*$/!')' %FJ' F ' RT## D' $(-' -':')+ &' J G !H'' $(-' '66'/+ %F=G ,4';'(+' $8)$:!,(' $/+!,(' FF' 66 ' FDAV ' A%' AJ' J A' 66 ' J=%' J=J' J=D' 66 ' J %'66 ' = ' = J' 66 ' =J< F A' 66 G 3)!(B$2'' @$:+'' ;$)B FF' 66 ' / W##,' J A' J= ' J=D' 66 ' JAA' 3$1' 5 , G *$/!$* 6!**!(2' @$:3 1*$!(' % ' J=' JFA' 66 ' J A66 ' JDA66 ' =J=66 G '$-' 2*$/!')' J= ' F AG '*67 8'--!(2 J=%' J=D
*$/!')' $; ' :e :'' *13$8'+ ,)' $1:G *'+:/3' *$:38$!' (-$)$B' ,),*;$:' ,-)4B' $*+,),' $)B!B.:3' $)$B3($.' ,)(')')!$H(,4:B!' !:1$)' $.-$*' !) $;!(' H)' 5$!*$B' $4!:3.)' 2*!,' $B:3!6' ,)$B' $;$' $2.($B!' 8B' B$/3B,4' □,*:+,4' $)B3!/3' C$)$6:3$(
$/!$+!,(e' :'' $:,' G 3$1:' !!' 4!!' E' E!' S ' 11'(-!EG *1!('' 2*$/!$+!,(' /,;1$)'-' =' =%'66 ' A%' J% ' JA:' J& ' 66 ' =J=' 66 ' =F ' F '66'G ')!,-:' %F '66 ' J O F ' AJ' DA' J= ' J& ' 66 ' =J=' F '66 ' F D'66 ' /' *,::G $(-'*,':' JA' J!6!' F =' 66G ,6 .$$' %F '66 ' J O F < =D '66 ' F '66 G),+'/+!,(' %F '66 ' J% ' J %'66G '$-' +)'':' A&G '(/3':' ,4') -''1'(!(2 A%' DA' = FG .(-)5 '4!-'(/'' '!&66 ' J ,66 ' JFA' 66 ' JA=66 G *$/!$* 4$**'5:' %D' =JAV ' J A' J&F' J&D' = F' = &' = J' 66 ' = F' =D=G $(-' +,1,2)$135 F '66 ' F D'66 ' FJ '66 G $.:':' F J%% ' F D'66
,)$!('':e AA' .##,' F%66 ' FD G' ' J% ' J=%' J=A66 ' JF% ' JAF' J ' J ' 3$1' E4 ' =% G $)!,.:' 6,),;:' FDD%' ' JFDDk' 'H(D' &>(G !(' /,(2*,;')$+'' =% G ($*,2,.:' 6,),;$+!,(:' %& G /,;1$)'-' @!+3 ;.-:1$+':' %&DG $(-' /*!;$+'' AAG *-' ;,)$!('':')!66 ' % ' J&D ' F ' D ' D&' &J' J =' J A' 66 ' J%=D ' J ' JF%' ')&' JFA' JFD' JAF' J ' J ' 3$1' 5 , ' =JA' =A ' F D ' F &D G ,.*-')/*$5 & ' J%=D ' JFA' F ' F &D G :,*$+'-' ;,)$!('':' #"#' 66

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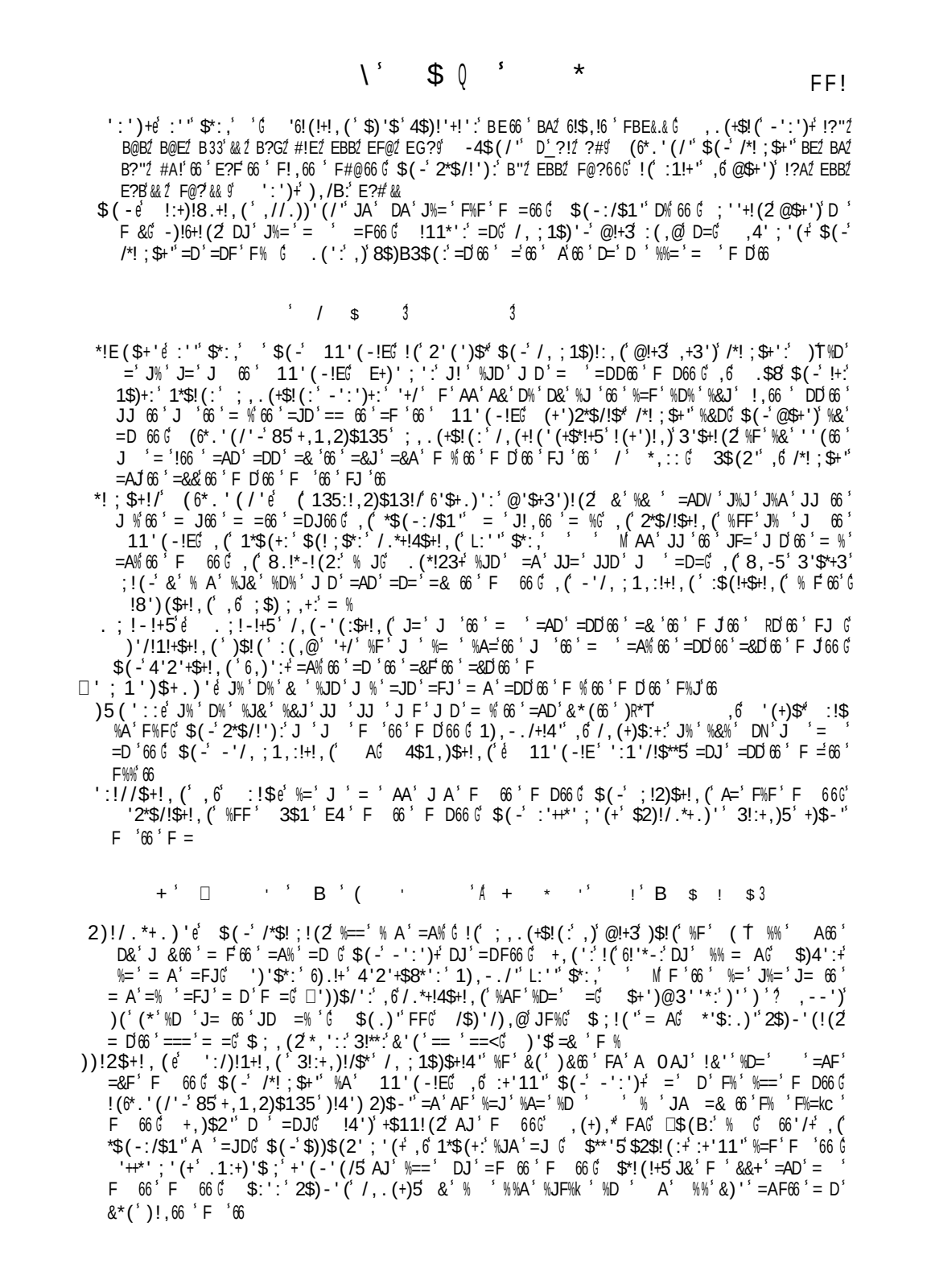
+'11''e :'' $*:,' G)!2!(' ,6+') ;' -'6!(!+!,(' F' 'G ',2)$13!/$* ;'$(!(2 $(-'!;1,)+$(/'' =' AG ,((''/+!,(' @!+3 *,':' JA' F =D G $(-:/$1':' $(-' 4$)!'+!':' ,6 +3'' :+'11'' D ' (&66 ' A' D ' DD' %%J' %FA' %A=' J D ' JA D' J F' J DD ' =J ' =F ' = D' =D&'66 ')/&66 G !** $(-' ;,.(+$!(' :+'11'' %=A' %DD' % ' A' DD' JJ ' JA D ' JAA' GUW##,' RFR,' = ' =J G $+')' '),.!,(' !))!2$+!,(' J&' F ' %=J' F DD G *,)$ $(-'6$.($F%' DF' %FDD ' %D=' J D ' JAA' J F' GUW##,' =&D' FJ G '2'+$8*'' 13$(+,;:' DFG *!;$+'' 3'$*+3 &' -'*' J 66 JD ' =D&D ' =&DG 1$;!)' F' /W##,' JF=D' J =' D ' =D
,':':'e '6!(!+!,(' ,)!2!(';!;1,)+$(/'' JA 0J&' FJ' F =' 66 G $:'$' ;,)13,*,2!/$* 6$/+,)' *$(-:/$1'' ,//.))'(/':' :3$1':' '),:!,(' J&' FJ' D' % F' %JA' %=J' %=F' % J' %D=' ' %D' DA' J%A' JJ=D ' J= ' = =' =J ' ==A' =F D ' =AAD ' = D ' F =DG .:+ %D ' JJF' =F G :':' 8.!*-!(2' ;$(.)'' FF' FD' %%' =AAG 3'(,;'($'6,2'')'' '66 &*)') 66'/+,(' 4'2'+$+!,(' $(-'+!;8')' &'(' &H&')
,$-:' /.++!(2:' A ' ==AD ' &)<,#> <(-' 2*$/!$+!,(' F F' 66 ' F &D



B < 4

, . : ' 8 . ! * - ! (2) / 3 ! + ' / + .) ' : ' : ' $ * : , ' FD & = % A6 % %A % JF 66 66 % % J A DJ DA J > = J D JD 6 = D = == 66 = AA = 66 = D , . : ! (2 , 6 (, ; $ - : ' : '

' ++ * ' (! ' (+ ! ** $ 2 ' , @ (: ' ' $ * : , ? % 66 % F % J A J D & J D J = JA ' (* = A == 66 == A =F 66 = D =D 66) ' R 66 ! (+ ') $ (- : . ; ; ')) ' : ! - ' (/ ' , 6 ! : : $) =F 66

, . : ' 3 , * - & = 66 & J &66 .) (! + .) ' FD & = 66 & A66 %%A JJ% 66 == =FA = 66 ')4$ (+ : * & % % M ' ' =F = 66 . ' F % J =AF $) - ' (! (2 = D 66 ' == ' = =) ' : : FD &D * , ! ' % J ' ! (A=66 JJ 66 JA === =FA $8 ! + : $ (- . : + , ; :) ! 4 $ + ' $ (- 1 . 8 * ! / * ! 6 ' ! (2 ' ( ) $ * & & = 66 & % 66 % % % %J% %J = 66 % = J 66 JJ 66 J= J =F J & 66 = A &) ' 66 =A = 66 = & 66 +$ (- $) - , 6 *! 6 ' %J% = AG , - ') (+! ; ' : .) , 1 ' $ (! (6 * . ' (/ ' & % J = 66 % =66 JJ = D = 66 ! (,1 ' ($!) & , : 1 ! + $ * ! + 5 JJR 66 J = F JA JD =FA 66 =AD = 66 , : : ! 1 ' : 1) ' $ - ! (2 , 6 (' @ : && 66) . 2 $ * ! + 5 & F 66 AA = A = A B ! * $; $B ' : 3 ! 6 + : & F 66 ! (; , . (+ $! (: J A= = A =A) $ 4 ' * FD %D A= 66 D= 66 J % J J J=F 9 && + ' =F , 66 =AA . (+ ! (2 6 ! : 3 ! (2 A= = J & JD = A ; . : ' ; ' (+ : : 1 ,) + ' 2 $; ' : % J % %F & %D D J JD = D66 * ' $ (7 * ! (' : & = 66 &D %J = 66 % J = ; , - / , , B ') 5 ; ' $ * : & F 66 & 66 % A AA J JJ 66 JJD JA JD % = A =F . (! : 3 ; ' (+ : % = =F = $ + 3 8 .) ! $ L : ' $ * : , M 66 % = % F 66 = D= 66 ! / ! $ * : %% J % J ' ' R66 J = F = =% &) ' M &)) &) (M = , ; ' & = * , ! 66 % = %A& % J 66 D& J ! D66 J & JA JD % 66 = FA66 = = =D) ; ! (% %% J = % ' - ! / $ +) ' $ + ; ' (+ =FF ' : + ! 4 $, 6) $ H $ L ' (+ M = D 66

4 ! ' ' ' A $! '

, * B * ,) ' +5 ; , * , 25 ' ' + / * $ / ' $; ' : ' AJ D 66 &F 66 JF = 66 J F = %D & ((M) ') 66 / , + ! 4 ' , 66 ') ! (2 : ') $ 2 +) ' ' : ' ' + / ' L : ' ' $ * : , $H $) : ' 8 ' * , @ M % D = 66 J % J D 66 '2 ' (- , 6 $ H) $ + $ * ! =% D 66

' * ! 2 ! , (D 66 &% % %A& % = 66 J J 66 JD & \ c (66 = %D 66 &&& & (& = D $ ($ + ! / ! : ; & % J J ! 4 ! (' 1) ' : ' (/ ' =66 = A / + : ' D = 66 3) ! : + ! $ (! + 5 ; ! : : ! , (: D 66 % J D 66 ===G $ H $) : ' : 3) ! (' : ' 1 ! * 2) ! ; $ 2 ' AD %% = ' (&66 ! %F A D J Jkc J D 66 JF % = % 66 $: + ! (2 = D 66 ' : ' ' $ * : , *13$8 ' + 3) ! : + ! $ (' : * $; ' : ; $ ' * ! $ ($ (? (2 ! $; $ H $ (') $ H $ ' C ,) , $: +) ! $ (' +/

, (. ; ' (+ : , . K . ' : + , ; 8 : 1 $ * $ / ' : ' B $) $ 4 $ (: $) $! : ' /$: + * ' : ' L : ' ' < : , M F % A & 66 % 66 % 66 % == = D D DA J % = = D = % == =FF =AA = DG (6 * . ' (/ ' , 6 /*! ; $ + ' % JG (/, ; 1 * ' + ' : + $ + ' % DG *$ / ' ($; ' : ' ' *13$8 ' + 6), : ! $ 8 ' , B3$) $ ' !8! B3$ (. ;) $H) $ + B3$! H $) $) $. * ' !) $) $ 8 ' 3 !) 8 . - . (' 3$B3H ! (- ' ' 3 !) ' -$) ' **. 28 ' 2 ' C$) 4 $ - $ (

) + e ' &A ' % A ' % % ' D ' %F ' =, D66 ' ===66 G $) 1 ' + &AG 4 , * . + ! , (' $ (- ' -! : +) ! 8 . + ! , (' , 6 ,) ($; ' (+ ' === ' 66

' ! '

! : + ,) 5 ' , 6 ' . $ 8 e ' = ' 66 ' % ' &% ' ! (' 66 ' % F ' %J& ' %== ' ==D ' =F ' = ' =D ' 66 G . : : ! $ (' 'E1$ (: ! , (') M &% ' %J& ' = ' =% ' =F G $ + ') ' $ (- ' 1 , * ! + ! / : A ' F % 66 G , * - ' ; ! (! (2 = FG ! : + ,) ! / $ * 1 * $ / ' : G : ' ' *13$8 ' + e 6) , : ! $ 8 ' , B3$) $ ' $ / +) ! $ ' ! : : $) ') , ($ + ' ' $) B (- $ ' $; $) B$ (- ' , 2 - ! $ ($ ') $ (: , E ! $ ($ G ! : + ,) ! / $ * 1 ') : , (: G : ' ' *13$8 ' + e *' E$ (- ') ' +3 ') ' $ + ' ; !) : ' 8 - . ** $3 B3$ (' $H) $ + $ * ! ' > ' (23 ! H 3$ (' $. 66 ; $ ((' , (, **5 ' +, - - $) - ' ! ; .)

- ; ! (! : +) $ + ! , (e ' $ + ! 4 ' ' FA ' ! (' 66 ' %DF ' J ' 66 ' J %J ' JJ ' JF % ' = ' 66 ' == D ' &) ' ' 66 ' &) (' & (& ' & (* G . : : ! $ (' & ' % ' ! (' 66 ' %DF ' ' &D ' J %J ' J = ' =JD ' = = ' = D

') >)

\ Z $ Q ' * " " "

&' " ' !'

(*$: : !6!/$+!, (' $(-' +, 1, 2)$16!5d !' 66' J' ?, (+,1,2)$13!/$ ($; ':' D '66' &=' 66' ') '66M)')'66 G '$(!(2 ,6 8, . (-$)!':' $(-' ($; ':' J G !)/ .*$+!, (,6 *, ':' $(-' @$+') 8'+@'' (; , . (+$!(:' 1*$!(:' $(-' $!)' J&' 66' F '66 G , (; , . (+$!(:' $(-' 1*$!(:' J&' 66' =J' J% '66' JJ '66' =D '66' =&F' 66' G !)/ .*$+!, (,6 '$)+3 *!6 FJ' JAJ' 66' =DD' =&F' F D' 66' G , (@,)B $(-' *$H!('':' F&G $+!4'' *!6 / , (+)$:+'-' @!+3 .), 1'$(&&' %J% 66' AG , (2, ::!1' % G . ::!$(:' $(-' ; , . (+$!(:' % ' &=G $+!4'' /3$)$/+')' $(-')'*$+!4!+5 ,6)$/!$ $11)'/!$+!, (:' %J% 66 G .+6!+ $(-' +)$4'**!(2 %D '66' G 66'/+ ,6 /*! ; $+' .1, (*$(-:/$1' -)5('::' $(-' ; ,!:+.) /, (+)$:+'-' G :3$1':' , /'$(' $+ ; , :13') %& '66' FJ '66' G '$.+5 ,6 *$(-:/$1' $(-' 1'):, ($ 4!'@:' %&J' G $++*' ,6 +3' '*' ; '(+N' 3'$+ $(-' /, *-' '+/' J&' 66' FJ' %& '66' =' DD' 66' JAJ' 66' J % 66' =D '66' =DD' =&F' 66' F%A' 66' F =' 66 G , (4!**$2' *!6 A G , (+$; $:3$ D G)+!:+!/ :'(:' ($+!4' $(-' .), 1'$(%A' 66' G , ( )!4')' @,)B $(-' ; , . (+$!(:' =F' JAJ' 66 G 51'':' , 6 *$(-:/$1' $(-' 135:!, 2)$135 =D' == '66' G .//'::!4' 13$:'-' $(-' +)$(:6,) ; $+!, (:' , 6 @$+') $/+!, (AJ' 66' JA '66' =DD' G 3' C$)$6:3$(')!4')' $:' $:5 ; 8, * AG , (!8'E -)$@!(2:' $(-' +3 :/)!88*!(2 !(:+!(/+ D=' 66 G $(-:/$1' $(-' $*+!+. -':' J% '66 G , (4, +!4 , 66')!(2:' D=' 66' J D' 66 D , (($+!4' 3, :1!+$*!+5 JJ '66' G 4, *.+!, (, 6 ; !--*' 3!**:' JJ '66 G ,)$!('':' , 6 . 1/3'B G 135:!/$ 6,)/':' 1,)+)$5'-' 85 *$(-:/$1' JFD' 66 G , ( )!4')'), :!, ($(-' ,)2$(!:$+!, (, 6 @$+')' $/+!, (JAJ' 66' G *! ; 8!(2 , 6 3!23 ; , . (+$!(:' JAA' 66 G '$+3')!(2 2*$/!$+!, (1), +'/+!, (J % 66 G , ; $-!: ;' $(-' +3' (, ; $-!/ !(:+!(/+ JD '66' G , (/$+$:+), 13':' $(-' :*, @ 1), /'::' :' J&D' 66' = '66 G $5:+$/B:' $(-' $)/3!+'/+.)' =% 'G)+ ,)!2!(:' %A' 66' =% '===' 66 G 4, *.+!, (, 6 , *,)$-, ' 6,) ; :' = J' 66 G , ; 1$)$+!4' *$(-:/$1' L , .+3 *1!('M == '66' G 4, *.+!, ($(-')'*$+!, (:3!1 , 6 ,)($; '(+ ===' 66!G ,)':+ 8!, *, 25 $(-' 135:!, 2)$135 =A% 66' =&D' 66 G 35:!, 2)$135 $(-' 8!, *, 25 , 6 .$8 =D '66' F D' 66' F =' 66' G $(-':')+ $(-' , /'$(=DF' 66' G , B3$)$)':/'(+ =DD G 4$1,)$+!, (=&F' 66' F%A' 66 G , /B:' $(-' :/!'(/'' F =

' □ ' S

□3!:' 1$)+ !:' $* ; , :+ '(+!)'*5)':+)!/+'-' +, 1), 1') ($; ':' , +' !(/*.-'-0@!+3 $ 6'@ 'E/'1+!, (:0$)'' +3'' (2*!:3 ,) $+!(' ($; ':' , 6 1*$(+:' $(-' $(!;$*:' (,) ; , :+ , 6 +3'' ; '+',), *, 2!/$:+$+!, (:' $(-' *, /$*!+!':' , 6 +3'' 11'(-!E

8-.**$3 3$(' !3F'
8-.)3$; $(3$(' EF@'
/3!B +:' $(-' ; ,)$!('::' #FF' #GG' J '66'
3$1' 5, ' F@B G :/'(+' #A@' 66'
623$(!:+$(' 623$(:' N' ?' !?' 8!A' B?!' && ' E@A'
E!?' EBG' EEB' EE?' F!M
6)!/$ =A%' =D=')'&
6), :!$8 % ' % F' 66' % '66' % &
2$ 3$(' = D
2$*!B A' %=%' 66' %=:' F
!*$(+3.:' %F&
B -$)5$ A%
B3.(+ ' 66
B)8+' &((
B:$!1*$+'$.',)1$; !)' =' J D
B+$:3 ' =A%
B+$.' +:' F&' %=%' %A'
*$! +:' %&' J' AF' % A' %D&' JJA' J=='JA='JAA'
= '=%D' D M=D' 66M [DM), , 66T FR' ##D "]C
0 4$**'5 % ' J D
*$! $; !):' ,) .$8 ; , . (+$!(:' %A' '/M '&T
J%A' = J' =DD' F '<6
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*8')+' :''' ,)'(H
'11, ' 8, ! &
*'+:/3 ' JF' A'
*'E$(-')' +3'')'$+' =' % F'
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5#' =JD
. $ ' JF'
/3.*+H' , ' E@?'
/3.:+')' J=
/3@$)H F'66 ' %A&' J% ' &R , ' =DD ' =& ' F% ') / !'
/,+*$(-' &' J A' J '
/,+/3 ;$(' FA'
'*-$)$' ' $(-' ' '))'
'*-! +$.' +:' JFF'66
' ;!1$*$+!(:B' !!'
' ;!+':' JDJ' = '
' ;!+!/' /.*+' J D'
'4')+:,4' JF=
' +' ') Ċ ')&M JAFM' JD=' 66
3$B38$)+ $*!' =%D'
3$B3 ! ;$L)M-$(' = ' =%D'
3$B3!:!$'
3$B3)!:!$8:' %=%' %F ' %F&' D%' =FJ' = D
3$B3).-' $)!B' FA
3$B3H!(-'' %
3$B*!:.' ' JF ' JF ' JF=' JFA
3$)' = D
3$):3$.H = '66
3$4$-B!' % '
3'+*$(-:' ==A'
3!B$)1.)!' D'
3!*8'' +' J %'
3!(2$*!/3' JJ '66
3!)8.-.(' FA' % A'
3!)-$)' ;'-)'::'' % F'
3!)!B3.-$ =%D'
3.2($(' = '
3. ;B$)$' +' JAA'
3.)$8' = A
!8')!$' =A%' =D%' F ' F J' F &
!*-' S+N' ' , ' !/B')M % D' J%D' JAA' J -' =DD
!*-!' ' $(-' ' JFA
!(2$(6.' *,':' F &
!(?!' =J
!) -$)5$' *' =' JD ' F% '66 ' F% '66
B$/3B,4' ' '
B$(-!($4!$' %J') 'R
,2-!$($' =
,B3' ' AJ' AF' %=F'
,)8.B3' ' J &'
,)23. ;' FA'
, .+3-,@(' ; .++,(' '1/'
, .+3' '$' :*$(-:' = J'
1$(!$)-:' ==A'
1!+:8')2'(' J%J')'&
+'!(' F '
+,--$)-' = =
.$('+!$L(:M ' J &' =D
. -$(' % J'
.(-.B*!' -':')+' = '
.1$(' =&&
.)B3$8' ' ,6' $(' D '66 ' J A'66 G ,6' $)$+'2!(
/*)M ''&'66M JJD'66 ' '&*' 66 ' ' &*' 66 ' ')&' ')+' '
JA ' JA=' JDA'66 ' = J'
.)B3$(' ' =F ' =F '
.:*!B' DF
@'-!:3' 6,)':+' =AJ'
@!::' :'' @!+H')*$(-
@!+H')*$(-G /, ;1$)'-' D ' J% ' J ' J &'
=D ' F G $*1' D&G ; , .(+$!(' ')!(2' G
:'' $*:,' *1:

□$8.:3!(' '
□2) ;$' %
□$2-. ;8$:3' %'66
□$?!B:' ' = D' =D ' FJF'66'
□$B3+$ B$)$/3$' ' %A=' = D'66
□$B*$)(B(' -':')+' F ' FJ='
□$*$:B! $*$+$.' +:' = ' F %'66
□$*8$)' =% ' = J'
□$;')*$(' ' :'' □! ;.)'
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□$)! ;' ,)' ,1' '$(-'8$:!(' ! ' %&' A=' F% '66
□$)+$):' :'' □$+$):
□$:3B'(+' % ' %==' %A&
□$+$):' D' %DF' =FF'66
□$. ;'(' J
□'?'(' ' =' =AA
□' ;!)2$(-$)$' ' $(-' ' JFA
□'(2! B3,)$;' = D
□3$;':' J=' ==D
□3',-.*' ' =
□!$(:3$(' +:' % ' %A' %&' J' J=' JF ' J D'
)R 'M R*M F%FG' 1)./'' % G' *! ;$+'' -+' ='
11'(-!E'=DD'66'G □'))$/':' J='
□!8'+' %&'66 ' J=%' '&(' =DA'66 ' &*(' T)')'&
□! ;.)' F' %D ' A' DJ' = F'
□!(!.)-')$ B.*' ' J ' =A '66
□!)$/3 ;!)' +' %D'
□!)$B*!' ' = =' 66
□,*:+,4' ' FF'66
□,4$)8'2' +' JFF'
□)$(:/$:1!$' !' =%D'
□)$(:/$./$:!$(' 5$!*$' D&'
□)$(:,E!$($' !'
□)1+$' % '
□:$!-$;' ' %A'
□.1$*$(2' ' =AA'
□.+B$.*' ==A'66
□5),*' □5),*':'' JF%' == ' =D '
□5),*':'' ,-'(' D&

```
.1/3'B  %FJ   F   JF   JF=  6%   JA   ##,
   3$1  5 ,  F
    !++*"  JF  6%  JF=  J&  66  = D
.)$(  !
.)B':+$(  ,1,2)$135  1$)+:  !  66  J 66  A
   &J  $(-   .$8  !  66  $ ;  "  JG   )5$(:=  G
   *! ; $+'  :'"   11'(-!E
    3!('::  :$(6"  $:   $:+')(
 0<  $:+')(  !  %= %& %   =DJ  G:'"$*:,   :!$
    .::!$(  :$ ;  "  $:   ':+')(
    ':+')(  *
    !+5 J
    +:  F& AF % % %DF %&&  %   F=  D% J
.)B'5 % =
.)B!  )$/':  $(-  *$(2.$2"  A  J &  JDJ  =D
  )')
.)B!:3 8$+3:   ("
.)B ; '(  :'"  .)B, ; $(:
.)B, ; $(:  A 66  ===  =D
.)B:  .)B!:3 =  ==A
.)(')  %D=
.)1$B   %=A  =AD

**.28'2  ; '-)'::"  % D
)$+!.8"   D%
)$H$ 6$:+  = D 66
)2.+  %A  66  %
) ; !+$(  %DA  %&D     JF
)+$ +.2$!  =JD 66
:38$   +  &J
:+$($B  %F
:+   )+ JD
H8'B,  $)+:  A 66  =D  FJF 66  :'"  $*:,  $)+:
H8'B:   =AA  =
H8,!  F%%  F%&

$-!6   A  =%
$B:3   &F  =%   ==A 66
$*$!:$(  8!::"
$ ; 8')5 &
$)-$/3!+  ,*-  )!4')  8'-  >J
$)-$2$(  %D&   I
$)H! ; !($)  AA  % D  %D&   D  % 66  J
  D 66  J =
$:3$(+$23   +  &J 66 G  ++' ; 1+  &
':3$8  % 66
!'((  %A
!')(5   % F  =DF
!:3B'(
,).   &F J

$-!  FJ

$!+$B!  8$:!(  =%
$B3?!)     ,.)/"  ,6  E.:  !
'*:3  ; ,.(+$!(:  %=A
':')   J=
':+')(  .)B':+$(  :'"  .)B':+$(
':+13$*!$(  :+'11"  D
,,*:$/B:  %F 66
!!) ;  1')!,-  %F=  66   =%  66  J&  66  F
   /  *,::

S'),13!*,.:  1*$(+:   D

$8,(  %D&  %&D     J  JF
$2(,8   $(-  4$**'5  D  =J  D  DA  &J
  J =  J &  = D
$B$:$)$!  =  66
$B$+.+  FJ
$B3:.   $(-   ,(2*, ; ')$+':  J  %DD  = =  66
  = &  66  =%  66  = J  66 M &'(M =
$(2! B!:3*$B =
$(2!*!B   =A%
$(2! :$8$B   + J F
$)B3!/3   F&  A%  AJ
$), ;  =  A J  J 'G  *$/!')'(-  =  =
$)+'1"  =
$:3!*B.*   $(-   JF  JF=  JA
!)!B  JDJ
,.(23.:8$(-  J F
.)/3!  =AF

C$2$)$   =  =D=
C$)$6:3$(   $(-4$**'5G   '(')$*-':/)!1+!,(
  *$(-:/$1':  J 66  ==  66   % D  %JA  %A=I<
  /*/  A  J F  F A G  5-),2)$135  !))!2$7
  +!,(  -':!//$+!,(  =  F&  AJ   D  %  66
  %=J  J%  JJ G   '1,:!+:  +'))$/':  ; .-
  :1$+':  %D&  %&J 66  %&D  J  F  J%  J&
  = D  =D G   '$+3')  /*! ;$+"  AA  % 66
   11  =DD 66 G   !"'  D AJ  %%
  JJ  =D 'G  '))5   66 G  1)!/,+:  %=
   2*$/!')  2*$/!$+!,(  1')!,-  :(,@ *!('
  $#*  .66  # 66  3$1  %*   *  $ *
  $ *'(&*$.  *'*)  *  $ *#  *#
 0 0  +:  66
   A
C$)$4$+  A
C$)-$*!$   $(-4$**'5   =
C$)-,*!.   =F 66
C$)4$-$(  ).!(:  DA  J%=
C')!.H$ ;!(   JF  = =
C,),$:+)!$(  @,):3!1
C. ;8.*  J=%
```

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